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…

8th November: Charlton Clark, Australian Antarctic Division

"Australia's Antarctic Interests: The Next 20 Years"

15th November: Presentations & Panel Discussion

"Earthrise: Looking Back on our Planet"

December Advance Notice

13th December: RSV Research Medal Lecture & Medallists' Dinner

"Medical Bionics & Visualising Immunity"

November 2018 Newsletter

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Melbourne Victoria 3000
Tel. (03) 9663 5259
rsv.org.au

Australia's Antarctic Interests – the Next Twenty Years

With a Dedication of the RSV's Antarctic Collection in the Phillip Law Room

Thursday, 8th November 2018 at 7:00pm

Speaker: Mr Charlton Clark

General Manager Strategies, The Australian Antarctic Division

Antarctica is strategically important to Australia: we assert our sovereignty over **42 per cent** of the Antarctic continent under the conditions of the Antarctic Treaty, and 36 per cent of our nation's maritime jurisdiction lies south of Australia. We have been a leader in Antarctica for more than 100 years, and the non-militarisation of the southernmost continent provides a region of peace and security on our southern borders.

Australia's leadership is contingent on our nation maintaining its rigorous program of **Antarctic science** and capable administration of the Australian Antarctic Territory, including the environmental protection of terrestrial and marine ecologies and the economic opportunities offered to Tasmania as a gateway to the Southern Ocean.

In 2016, the Australian Government launched its **Antarctic Strategy and 20 Year Action Plan**. The strategy clearly sets out Australia's Antarctic interests and its plans to ensure they are delivered over the coming decades. Join Charlton Clark from the Australian Antarctic Division, who will provide an overview of this important planning work and an update on some of the key elements that underpin the strategy, including the modernisation of Australia's infrastructure on the continent.

About the Speaker:

Charlton Clark is the General Manager of the Strategies Branch at the Australian Antarctic Division. He is responsible for the delivery of Australia's Antarctic policy interests, including coordinating the whole of government implementation of Australia's Antarctic Strategy and 20 Year Action Plan.

Prior to re-joining the Division in 2016, Charlton played a lead role in the establishment of Australia's national network of marine protected areas and the strategic assessment of Australia's marine environment. Charlton's first period at the Division was from 2001 to 2008, where he led the development of the intercontinental airlink between Hobart and Antarctica. Earlier, he served as an officer in the Australian Army. Charlton holds a Bachelor of Arts with Honours in politics and management from the University of New South Wales and is a graduate of the Royal Military College, Duntroon and the Australian Defence Force Academy.

Celebrating the Antarctic Collection

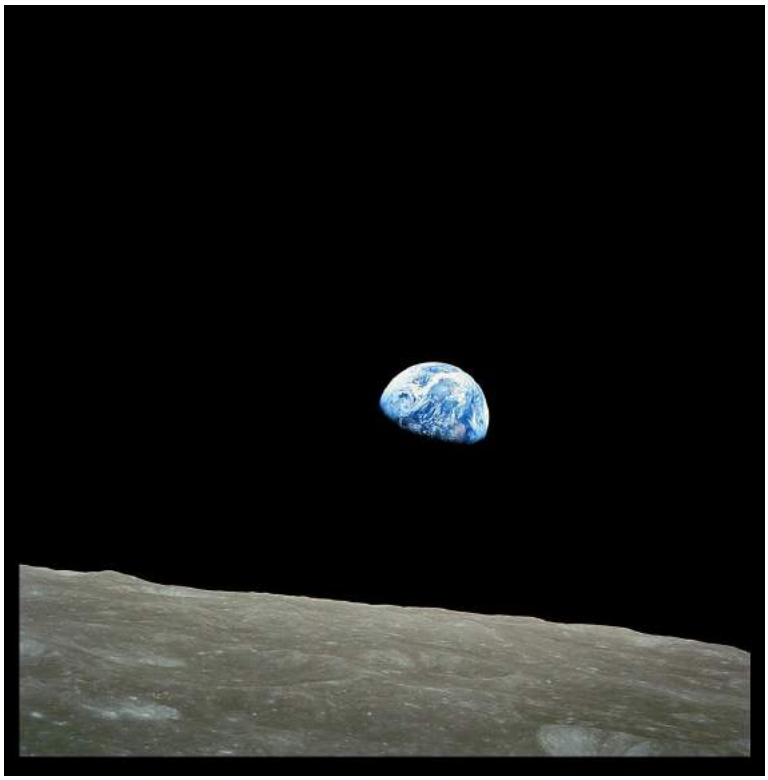
Those joining us for "Lecture + Food + Company" gathering from 6pm will participate in the dedication of the RSV's Antarctic Collection in the Phillip Law Room's freshly-installed library, with the President of the ANARE Club, Dr Joseph Johnson. The Antarctic Collection features volumes from collections donated to the Society by the estates of Dr Phillip Garth Law, Dr Hilary Harrington and a variety of other sources.

Eventbrite

Places limited, bookings essential! Pre-lecture function from 6:00pm. **Register online** now at https://rsv.org.au/events/australias-antarctic-interests/, call or email the RSV office to secure your place: 9663 5259, rsv@rsv.org.au. **RSV Members** should check their emails, or call the RSV office to access their **discount code**.

"Earthrise" – Looking Back on our Planet

Thursday, 15th November 2018 at 7:00pm



Interdisciplinary Panel Presentations & Discussion

Featuring:

Dr Colleen Boyle, Artist & Historian with RMIT University's School of Design

Dr Jenny Gray, CEO of Zoos Victoria and President of the World Association of Zoos & Aquariums

Professor Rachel Webster, Head of Astrophysics at the University of Melbourne's School of Physics

Dr Lynette Bettio, Senior Climatologist with the Bureau of Meteorology

MC: Alicia Sometimes, Broadcaster, Poet and Writer

What's in a picture?

Almost 50 years ago on Christmas Eve, 1968, US astronaut William Anders took a photo aboard the Apollo 8 mission that became known as 'Earthrise.' This ground-breaking image transformed our view of our unique planet, and the place of our home in the cosmos.

Apollo 8 was the first manned spacecraft to leave the Earth's orbit and circle the Moon. When the craft piloted by William Anders and his fellow crewmen Frank Borman and Jim Lovell emerged from behind the Moon's dark side, they saw in front of them an astounding sight – an exquisite blue sphere hanging in the blackness of space.

Taking this photograph was one of the most profound events in the history of human culture, for at this moment we truly saw ourselves from a distance for the first time; and the Earth in its surrounding, dark emptiness not only seemed infinitely beautiful, but also extraordinarily fragile. This wonderful image crystallised and cemented the sense of our planet's isolation and vulnerability. It is linked to the start of the environmental movement and to many significant concepts developed and popularised over the last 50 years such as Spaceship Earth, Limits to Growth, Small is Beautiful, Sustainability and Gaia. It is a significant signpost for our ongoing struggle to safeguard the vitality and viability of our living planet.

Places limited, bookings essential! Pre-lecture function from 6:00pm. **Register online** now at https://rsv.org.au/events/earthrise/, call or email the RSV office to secure your place: 9663 5259, rsv@rsv.org.au. **RSV Members** should check their emails, or call the RSV office to access their **discount code**.

Robots and 3D Bio-Printing: Shaping Surgery

Wednesday, 7th November 2018 at 6:00pm

The Doherty Institute for Infection & Immunity

Speaker: Dr Claudia Di Bella

Leader of Cartilage Regeneration Program of Research, Department of Surgery, The University of Melbourne

Much has changed in the field of surgery in the past 50 years; new technology is changing the way surgeons operate.

While surgery has traditionally been a speciality characterised by hand skills and, at times, 'educated improvisation', it is now becoming a field where robots, computer guidance, 3D printing and bio-printing are changing the way surgeons operate, sometimes 'driving' their hands to levels of precisions never imagined before.

In the recent years, 3D printing and bio-printing have gained increasing interest in surgery. 3D Printing can already be used in a wide variety of ways in surgery, for example:

1. for the manufacturing of anatomic models that mimic the patient's anatomy (including deformities, microvasculature, cancers);
2. to produce patient-specific cutting guides that drive the surgeon's hand in performing precise cuts for bone removal; or
3. to create custom made implants that help managing complex surgical problems. More recently, the possibility of 3D printing live cells in a specific environment, have further opened the possibilities in the field of regenerative medicine. This technique carries huge expectations from the surgical community, because it promises the potential regeneration of entire living organs.

Dr Claudia Di Bella will explore and discuss the technological advances now available to surgeons and the ones that will possibly become a reality in the near future. She will also discuss the current state of the art in bio-printing from a surgical prospective, focusing on its application in the musculoskeletal field. Dr Di Bella will highlight the current roadblocks for the application of this technique in clinical practice, as well as the expectations and the promises for the future seen with the eyes of the final user.

About the Speaker:

Dr Claudia Di Bella is an academic orthopaedic surgeon highly specialised in musculoskeletal oncology, advanced robotic assisted surgery and 3D printing.

Dr Di Bella graduated in medicine and surgery in 2002 (Bologna University, Italy) and subsequently obtained her specialist recognition as orthopaedic surgeon in 2007 (Bologna University, Ita) as well as a PhD in Oncology and Experimental pathology in 2012 (Bologna University). Dr Di Bella moved to Australia (Melbourne) in December 2009, and in 2014 obtained the recognition as qualified Orthopaedic Surgeon by the Royal Australasian College of Surgeons and the Australian Orthopaedic Association.

In 2015 Dr Di Bella became the leader of the Cartilage Regeneration Program of Research, a branch of the Advanced Limb reconstruction Program that has been developed at the Department of Surgery (University of Melbourne), centred over the use of advanced 3D printing technologies, including surgical 3D bioprinting, robotics and stem cells for the regeneration of the musculoskeletal system. In this role Dr Di Bella has led her team to

successfully secure more than 12 national peer reviewed grants, reinforced and strengthened national and international collaboration with key players in the field, and strongly contributed to the advances of the Biofab3D, the first Australian biofabrication hub embedded in the hospital setting. The successes of Dr Di Bella's team have been recently recognised internationally (multiple award winning at international tissue engineering societies) and nationally (Finalist at the prestigious NSW Eureka prize for Excellence in Interdisciplinary Scientific Research), and showcased by national media such as ABC news, Channel 7 news, The Project (Channel 10) and National Geographic.

Dr Di Bella currently sits on the Education Committee at the University of Melbourne and on the Executive Committee at the Biofab3D; she also is a professional spokesperson at the Human Ethics Research Committee at St Vincent's Hospital as well as a faculty member of the Academic Surgery of the Royal Australasian College of Surgery.

Dr Di Bella is very passionate about gender equality in STEM-M, and for this reason she is a mentor in the academic surgery program of the University of Melbourne as well as a mentor for women in medicine at St Vincent's Hospital.

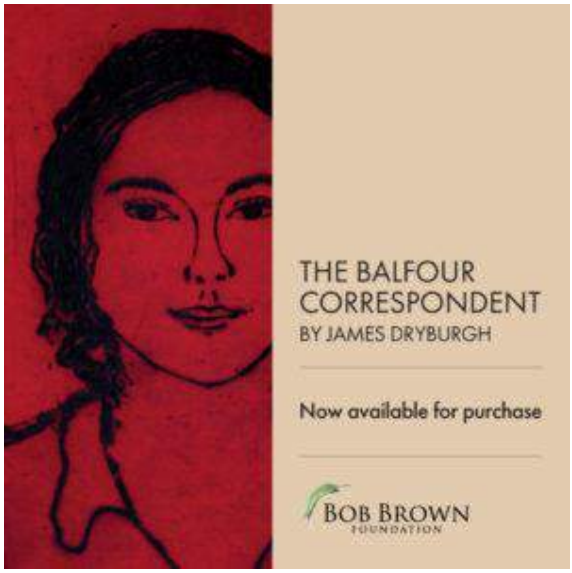
*Presented by the **Convergence Science Network**.*

Places limited, bookings essential! Register online now at https://inspiringvictoria.org.au/event/robots-and-3d-bio-printing/.

Book Launch: The Balfour Correspondent

Sunday, 11th November 2018 at 2:00pm

The Royal Society of Victoria



Featuring **Julian Burnside QC** in conversation with **James Dryburgh**, author

You are warmly invited to a conversation with **Julian Burnside QC** and author of *The Balfour Correspondent,* **James Dryburgh**.

The Balfour Correspondent is a compelling reader's response to a young girls' letters written to a Tasmanian Newspaper over 100 years ago.

During 1912, fourteen-year old girl, Sylvia McArthur, writes to a weekly Tasmanian newspaper from Tasmania's wilds. Her letters from the doomed bush town of Balfour, in the lands we now think of as the Tarkine, have been forgotten for a century. James Dryburgh answers her letters, creating a strangely powerful dialogue across time and space and giving us a powerful sense of the forces that still do battle to shape our existence in this country, and on this Earth.

Tickets: Available via the **Eltham Book Store**, 970 Main Rd, Eltham. Ph: **(03) 9439 8700**. You can also RSVP at https://www.bobbrown.org.au/balfour_correspondent_book_launch

Price: $55 per person or $35 concession, (includes one signed copy of the book, the author's presentation and afternoon tea).

Children welcome. Enquiries to Emma Wasson at emma@bobbrown.org.au please.

*Presented by the **Bob Brown Foundation** with the support of the Royal Society of Victoria.*

Science Says! 2018

Saturday, 17th November 2018 at 3:30pm

The Royal Society of Victoria

Science Says! is science as you've never seen it before, and with a lot more laughter! Join us as brilliant scientists, gifted comedians and talented communicators use their wits and wittiness to uncover the top scientific discoveries of 2018 – and a few of the odder ones, too!

It's an evening in the style of the great panel shows – think mixing *Mock the Week*, *Spicks and Specks*, and just a dash of *QI*. Last years' shows saw physicists miming sticky saliva, professors donning hard hats, and biologists serenading the audience – all in the name science!

Hosted by **Dr Joel Gilmore** – scientist, comedian and co-host of *Food Lab* on SBS – you'll be guaranteed a night of entertainment, competition and comedy – and education, too! So secure your tickets early and join us in November to find out what *Science Says!*

Competing in Melbourne for all the glory science has to offer is:

Public health nerd, comedian and beekeeper, **Alanta Colley**

Astronomer and Lead Scientist of RiAus, **Prof Alan Duffy**

Science communicator, radio producer and field guide enthusiast, **Claire Farrugia**

Brain doctor and armchair philosopher, **Dr Anna He**

Science educator, boardgame designer and comedian, **Tom Lang**

ABC science reporter and proud owner of 261 Neanderthal variants, **Belinda Smith**.

Places limited, bookings essential! Register online now at https://rsv.org.au/events/science-says/.

Medical Bionics & Visualising Immunity:
The 2018 Medal for Research Excellence

Thursday, 13th December 2018 at 6:30pm

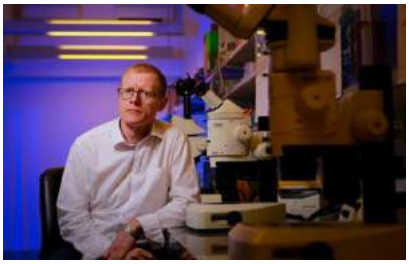
2018 Medallists:

Professor Anthony Burkitt
Chair in Bio-Signals & Bio-Systems, Department of Biomedical Engineering, The University of Melbourne

Professor Jamie Rossjohn
Head of Infection and Immunity Program, Monash Biomedicine Discovery Institute, Monash University

Two high achieving Medallists, two great talks! Come learn about the outstanding work of this year's recipients of the RSV Medal for Excellence in Scientific Research, **Professors Anthony Burkitt** and **Jamie Rossjohn**, who will be presented with their Medals by **Her Excellency the Governor of Victoria** on the evening.

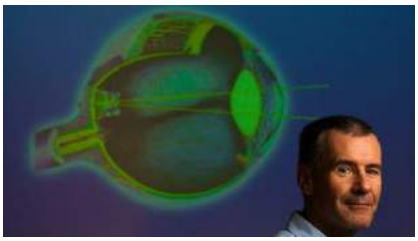
Visualising Immunity: Up Close and Personal



Following on from Leeuwenhoek's development of the microscope in the 17th century, scientists over the ensuing decades have been able to look into the world of microbes and cells. **Professor Jamie Rossjohn**'s laboratory uses a very powerful "microscope", namely the Australian Synchrotron, to visualise immunity.

The immune system is vital for our survival. It protects us from pathogens, such as Influenza. Sometimes the immune system goes wrong, and causes disease, including autoimmunity and allergies. Professor Rossjohn's laboratory has provided insight into the function and dysfunction underpinning the human immune system, and he will touch upon these findings.

Medical Bionics and the Quest to Restore Hearing and Sight



Medical bionics offers the possibility to people with profound sensory impairments, such as blindness and deafness, for the restoration of these faculties. This can lead to an improved quality of life for patients with degenerative neural conditions that arise through disease, accident or genetics.

Recent developments in medical bionics and the challenges associated with providing clinically safe and commercially competitive technologies to provide functional everyday benefits to patients will be presented by **Professor Anthony Burkitt.** These issues will be illustrated by the Bionic Vision Australia research program, which has developed a fully implantable retinal prosthesis, based upon a successful prototype study with three patients.

About the Medallists:

Professor Anthony Burkitt has held the Chair in Bio-Signals and Bio-Systems in the Department of Biomedical Engineering at the University of Melbourne since 2007. His research encompasses a number of areas of medical bionics and neuroscience, including neuroengineering, computational neuroscience, retinal-implant vision processing, cochlear-implant speech processing and bio-signal processing for epilepsy. His research has made significant contributions to understanding the behaviour and function of the brain and it has also been instrumental in the development of visual stimulation paradigms for retinal implants, new cochlear implant speech processing strategies, methods for detecting and predicting seizures, and the use of electrical stimulation for seizure abatement in epilepsy.

He was the Director of Bionic Vision Australia (2010-2016), a Special Research Initiative in Bionic Vision Science and Technology of the Australian Research Council (ARC), and he successfully led the project though all of its phases: Project conception, securing $50million in ARC funding, the research and development programs that led to the development of a prototype bionic eye (suprachoroidal retinal implant), the successful implantation in three patients, and the establishment of the company Bionic Vision Technologies (BVT) with US$18million of venture capital for the ongoing commercial and clinical development of the technology.

Professor Jamie Rossjohn is known for his contributions to the understanding the molecular basis underpinning immunity. He has used structural biology to explain pre-T-cell receptor (TCR) self-association in T-cell development, and how the TCR specifically recognises polymorphic Human Leukocyte Antigen (HLA) molecules in the context of viral immunity and aberrant T-cell reactivity. He has unearthed structural mechanisms of HLA polymorphism impacting on drug and food hypersensitivities, as well as Natural Killer cell receptor recognition. He has pioneered our molecular understanding of lipid-based immunity by T cells, revealing that it can differ fundamentally from peptide-mediated adaptive immunity. Recently he has provided a structural basis of how vitamin B metabolites can be presented and recognised by the immune system, revealing a new class of antigen. Collectively, he has published more than 365 papers and mentored numerous researchers towards obtaining higher degrees and nationally competitive fellowships.

He is currently an ARC Australian Laureate Fellow (2017-2021) and was previously an NHMRC Australia Fellow (2011-2016) and ARC Federation Fellow (2007-11). He is the Head of the Infection and Immunity Program of the Monash Biomedicine Discovery Institute.

Medallists' Dinner

We are delighted to invite RSV members and their guests to attend the 2018 Medallists' Dinner, our annual gathering to be hosted by the Society's President, Mr David Zerman in the Burke and Wills Room, following the talks from and presentations to Professor Rossjohn and Professor Burkitt. We will be joined by **Her Excellency the Governor of Victoria and Mr Howard QC.**

Registrations for the dinner include admission to the Research Medal Presentation and Lecture. Please join us for a convivial evening of celebration for science in Victoria and a reflection on the generative work of our Society in 2018. Tickets are inclusive of a three course, seated, plated meal with beverages.

While places at the lecture are open to the public, tickets to the dinner are only accessible by RSV Members – please enter the promotional code provided in the email of 31 October from the CEO, or call the RSV office during business hours on 9663 5259 for assistance.

Places limited, bookings essential! Register online now at https://rsv.org.au/events/2018-medal/, call or email the RSV office to secure your place: 9663 5259, rsv@rsv.org.au. **RSV Members** should check their emails, or call the RSV office to access their **discount code**.

Nominations for RSV Membership

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

Mr Christopher Thomas Edward **JONES**, Architect, Decibel Architecture
Dr Charles Sidney **SHERIDAN**, Specialist Orthodontist
Dr Krystal **EVANS**, CEO, BioMelbourne Network
Daniel Joseph **O'KEEFFE**, Coordinator, VicPhysics Teachers Network
Dr Anthony Oliver **POLMER**, General Practitioner
Associate Professor Lynette Elsie **CLEARIHAN**, Associate Dean of Professionalism, Faculty of Medicine, Monash University

Unless Members request a ballot, these 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 13th December 2018. Recently elected members who have not yet signed the Society's membership book are warmly invited to attend the 8h November 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.**

A number of established members have indicated they have never had an occasion to 'sign in' – again, **please let us know at the office** if you'd like to rectify the situation, and we'll make sure you get the opportunity!

A Month in the Life of the RSV President

An RSV Member recently asked me what I did as the Society's President – he thought I just chaired our 2 public lectures each month. This encouraged me to look at my October calendar and reflect on some of the activities I undertook on behalf of the Society and those coming up.

Some – but not all included – working with the Executive and assessors to determine the winners of RSV Medal of Research Excellence. Then it was my lucky job to inform the winners - including one who was overseas - of their award and also let their nominators know.

Shortly after that I was fortunate to chair the Heads of Agreement signing ceremony for the next stage of the proposed Magic development with our partners, Decibel Architecture and Grocon.

I worked with our CEO, Mike Flattley and Program Chair, Kevin Orrman-Rossiter, planning our 2019 lecture and visit program.

The spectacular presentation by Dr Drew Berry was a pleasure to chair and also gave me the opportunity to meet and greet about 100 members and guests who attended this.

At Executive and Council meetings during the month we developed strategies, discussed plans for future activities and confirmed several house-keeping issues presented to those meetings by the CEO and his team.

As well as these, I enjoyed discussions in person, or by email with a few our Members who had queries about the Society's activities.

The honour and pleasure of being the RSV President allows me to work with a great team of Executive and Council Members who enthusiastically believe in and work together to promote science in Victoria. All of this wouldn't be possible without the exceptional professional support we receive from our staff team led by Mike, who works with Malourie, James, Ann and Renee, and our casual staff members Sam, Cassandra, Doug and Nikki.

Together we work together for your benefit and hope that you enjoy and attend our functions. November and December mean many more functions coming up for us all to attend and participate in.

On Thursday November 8, besides a great lecture on Antarctica (with our friends from the ANARE Club) by Charlton Clark, we will be dedicating the Antarctic Collection in the Phillip Law Room's new library.

Thursday November 15 is a session about looking back at the Earth from space, with a great panel of speakers.

Saturday November 17 is another spectacular panel session with "Science Says."

In December our RSV Medal winners will make their presentations and receive their awards from

the Governor before the Medallists' Dinner, which is open to all our members. I urge you to book and pay quickly for what is becoming a sold-out event each year.

So to the Member who asked what the President does - I hope that gives you some insight.

As always if you want to discuss any of our activities please call me on 0418 346 999 or email me at president@rsv.org.au

Looking forward to catching up with you soon

- **David Zerman, President**

Professors Anthony Burkitt & Jamie Rossjohn are the 2018 RSV Medallists for Research Excellence

The Royal Society of Victoria is delighted to congratulate the two 2018 awardees of the RSV's Medal for Excellence in Scientific Research – **Professor Jamie Rossjohn** (Monash Biomedicine Discovery Institute) and **Professor Anthony Burkitt** (Bionic Vision Australia and the Melbourne School of Engineering).

This year the Medal was awarded in Category II – the **Biomedical and Health Sciences** and, while there have been joint awards made in the past (six times in fact – the last was in 1989), this is the first made entirely within the Biomedical category in the Medal's 60 year history.

The two medical scientists have a very different approach to their work, and pursue very different fields of inquiry. "The lines between the scientific disciplines are increasingly blurred in the 21st century," explains the Society's CEO, Mike Flattley. "Lately our assessors in all the RSV's awards and prizes are finding it difficult to draw the line between what work constitutes engineering, or environmental science, or medical science in this case."

"We have a scientist like Professor Rossjohn working with proteins and biochemistry to influence the functions of immune systems – classic medical science, perhaps – yet employing state-of-the-art techniques in crystallisation robotics, supercomputing and advanced molecular imaging with the Australian Synchrotron to get the results. When you look at Professor Burkitt's career, you have the emerging powerhouse of neuroengineering unfolding before your very eyes, intimately concerned with the function of the brain and its interaction with prosthetic technologies, and an amazing application of that knowledge base to achieve new capacities for those with impairments like epilepsy, or blindness, or hearing loss."

"Ultimately a modern scientist in these fields needs to be a software engineer, and a frontier toolmaker – challenging fields of expertise before you even start to consider the field of scientific inquiry!"

The Research Medal recognises peak research career achievements and outstanding leadership in research by scientists working in the State of Victoria. RSV President David Zerman emphasises the Medal is not just about discovery and innovation, but also about fostering and supporting a thriving research community and workforce to achieve collective impact. "Some of this is demonstrated through a scholar's personal output of journal articles and the related citations, or through patents and commercialisation, but it is also the research ecosystem that a leader supports through mentorship, collaboration and public engagement. We look very favourably on research leaders who bring effective teams together, and who actively promote younger scientists in particular, either through direct supervision, co-authorship of major papers, or simply creating opportunities for meaningful, purposeful work in an intensely competitive job market."

"In total, Professor Burkitt and Professor Rossjohn each have made world-class contributions that have, and will continue to transform lives and alleviate human suffering. I have to say a joint award between two outstanding scholars, one from Monash and the other from Melbourne, is a potent reflection of the incredible output by the State of Victoria in the medical and bioengineering sectors, with these two remarkable biomedical precincts contributing genuine, globally significant leadership in the medical sciences. We should all be very proud of what we are achieving as a State in producing and supporting such talent."

Professors Burkitt and Rossjohn will be presented with their Medals by **Her Excellency the Honourable Linda Dessau AC, Governor of Victoria**, following two short talks on their fields of inquiry on the evening of **13th December, 2018**. Full details and registrations are available from the Society's website at https://rsv.org.au/events/2018-medal/ .

A Magic Partnership Begins

Just getting started: Daniel Grollo (Grocon), David Zerman (RSV) and Dylan Brady (Decibel).

A group of about 16 people, including the Society's Councillors, the senior team from Grocon and the leaders of Decibel Architecture, convened in the historic Burke & Wills Room to sign a Heads of Agreement, setting out the scope of our collaboration for our proposed Magic Project.

In this remarkable place of historical significance to Victoria's heritage of scientific endeavour, we took the next step on the path to realising a future vision for Victoria's scientific capabilities. In exploring the boundaries of what we can achieve on our small, CBD site, we embark on a new expedition; to be well planned, and with the appropriate expertise in the mix to lead us through as a community of members and supporters.

RSV Councillors Dr Kevin Orrman-Rossiter, Dr Julie Boyce, Ms Rosie Stramandinoli, Dr Tom Beer and Dr Peter Baines with the "Magic" tower's conceptual model.

The "Magic" tower has occupied a lot of attention as a concept, as well it might – the "tallest building in the southern hemisphere" and the "world's most slender tower" have been consistent claims in the various news articles circulating in recent months. However, we don't yet know the final scale or character of the proposed triangular building at the tip of our block. The site remains unique, as does the architectural, engineering, business and planning challenge of realising the opportunity presented.

In approaching the prospect of development, we do so in a way that reflects our organisation's character and principles. We are focussed on the Magic project setting a new benchmark for **sustainable design and development.** In the months ahead, we will be exploring the state of building systems for **energy** capture, storage and use, as well as **water** capture, retention and reticulation. We will be looking at how our entire site – both the vertical tower and the balance of the RSV's grounds and facilities – can be designed to support **urban biodiversity** through incorporating ecological niches for diverse indigenous species, from wedgetail eagles to native bees, from hardy escarpment plantings to shade and moisture-loving gardens. We will be looking at how our **existing buildings** can be stabilised, refurbished, revitalised and extended to be fit for their contemporary purpose while celebrating their heritage character and history.

This is substantially new work in the development sector, and will require a **translational research** approach – the opportunities for involvement by some of Victoria's outstanding scholars in the broad field of sustainable urban development are plain to see.

The signing ceremony.

Most importantly, however, we will be looking at the Society's evolving **role** in the State of Victoria; how we can advocate for the role of science in decision making and policy development; how we can assist communities, governments and industries to connect purposefully with the vast expertise of our large community of scientific practice; how we can support the many professionals and volunteers conducting science

engagement work across the state; how we can truly celebrate and foster the achievements of Victoria's teachers, students and scientists at every point of their career trajectory as an independent organisation; and how we can offer our members, partners and supporters an outstanding experience of fellowship, lifelong learning, exploration and enjoyment of new knowledge. This is the **purpose** of the development, and we must ensure any new financial capacity is clearly paired with the scope of activities such an endowment must support.

Partners: the teams from the RSV, Grocon and Decibel.

Thanks to our partnership with Grocon and Decibel, we now have this remarkable opportunity to bring the expertise on board required to get started; planners, convenors, communicators. Our sincere gratitude is extended to **Dylan Brady** for his remarkable vision, drive and advocacy, and to **Daniel Grollo** for truly recognising the unique potential of this grand, "for-purpose" project, lending the financial support of Grocon to the Society for commissioning the consultation, design and planning endeavour ahead of us.

- **David Zerman**, **President**

A Silver Medallist - London Design Awards

Our warmest congratulations to our partners Decibel Architecture and Grocon for taking out a silver medal at the London Design Awards for their conceptual work on "Magic" as a "for-purpose" project!

"In an effort to revitalise Melbourne's 159-year-old science hub, the 'Magic' tower proposals hope to establish a new science engagement precinct for Melbourne, a state-wide science engagement program for Victorian communities and a benchmark tower development for the CBD under community-led development proposal."

"Importantly, this project is not a development play, but a community-driven, purpose project. The plans predict a $30million profit from apartment sales which will be used to upgrade RSV's heritage-listed home on the neighbouring site, develop a new science engagement centre and cafe, and create a perpetual endowment fund, enabling the RSV's purpose, projects and awards programs to be supercharged for the next 160 years."

"The residential tower will also double as a science engagement precinct and will demonstrate ingenuity, striving for PassivHaus standard and cutting-edge sustainable technologies."

The London Design Awards are convened to "accelerate transformation, celebrate courage and grow demand for design."

Genetic Rescue

By Scott Reddiex & Catriona Nguyen-Robertson MRSV
RSV Science Communications Officers

This article follows a presentation to the Royal Society of Victoria by Dr Andrew Weeks, Director & Ecological Geneticist with conservation and agricultural management organisation Cesar on 13th September 2018, titled "Genetic Rescue: Thinking Small to Save Threatened Species."

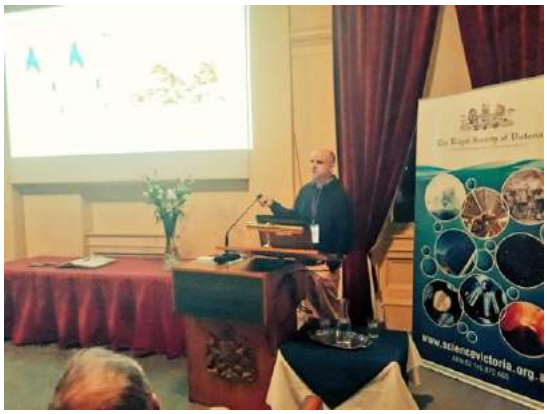
You may not know it, but Australia is facing an extinction crisis. With the worst rate of mammalian extinction in the world, over 1,700 species of animals and plants are currently at risk of becoming extinct in Australia [i]. Many factors have contributed to this loss of biodiversity, including feral animals (not just predators, but also herbivores that compete for the same food sources), clearing of native vegetation, weeds, and changes in fire regimes. While some of these problems are being addressed to varying degrees, many threatened species still have a high risk of extinction even if the populations are physically protected from danger due to their poor genetic health.

The genetic health of a species, broadly speaking, refers to how outbred the population is. The fewer animals remaining, the greater the chance of inbreeding, and with it the greater risk of hereditary diseases. Thankfully, **Dr Andrew Weeks**, Director and Ecological Geneticist at the conservation and agricultural management organisation **Cesar**, has part of the solution.

In order to understand the impact of environmental change on flora and fauna, ecologists model and analyse the distribution of species in their habitats. This work involves mapping where individuals of a species are located in a defined area and predicting how the population distribution will respond to changes in their environment, such as increased temperature or decreased rainfall. One thing that ecologists haven't classically factored in to their analyses, however, is the ability of a species to adapt to its environment. The **redlegged earth mite** (*Halotydeus destructor*), a major pest in Australian farming, was accidentally brought into Western Australia from southern South Africa in the early 1900s. From its point of introduction, it rapidly spread eastwards and inland, occupying more environmental niches in Australia than was predicted based on their distribution in South Africa. This highlighted that species can surprise us with their ability to adapt and evolve as they encounter new environments.

While it was originally thought that evolution and adaptation was a slow process that occurred over hundreds to thousands of years, we now know that it can occur quickly over a few generations, particularly in species that have much shorter life-cycles.

The ability of any species to adapt to their environment is based on their genetics, specifically the gene variants that exist in the population. For every gene in the genome, there may be multiple variants that have arisen due to mutations of the DNA. These different versions of the same gene are referred to as alleles, and offspring inherit either two identical alleles (homozygosity) or two different alleles (heterozygosity) for every gene – one from each parent. Many mutations are referred to as 'silent' (i.e. having no effect), some can be deleterious (having a negative effect), and others advantageous. Darwin's theory of natural selection states that when an allele provides an advantageous characteristic an individual will be fitter than their peers, and consequently better equipped to survive and pass on their version of the gene, while deleterious alleles will be weeded out. It is therefore beneficial for a population to be more genetically diverse, because the more variation there is, the greater the chance of individuals having particular traits that may prove helpful in surviving changing environments.



Dr Weeks is investigating two key factors that play a role in a population's genetic diversity: population size (the more individuals, the greater the chance of mutations arising) and migration (connectivity of separated populations). It has been shown that particularly in small, isolated populations, lower genetic diversity increases the risk of a species becoming extinct [ii]. It is therefore a concern for ecologists when separate populations believed to be connected are in fact isolated, resulting in a complete lack of genetic transfer between the groups. It is consideration of these factors that inform the genetic rescue approaches employed by Dr Weeks when addressing a population facing extinction.

Over time, small populations succumb to random genetic drift. This describes the process in which variant alleles are lost from the gene pool, leaving only one allele for a given gene, and results in the population becoming maladaptive. Without gene flow, in which alleles are shared between populations, species become less able to adapt to selective pressures from the environment and may find themselves on the brink of extinction.

Of the 86 Australian terrestrial mammals currently listed as critically endangered under the International Union for Conservation of Nature and Natural Resources (IUCN) Red List [iii], 74% have very fragmented and declining distributions. Dr Weeks is involved with conservation projects for four of these species: the mountain pygmy possum, eastern barred bandicoot, eastern quoll and the **northern quoll** – all of which only exist in a handful of small populations, suffering extreme loss of genetic variation and inbreeding as a result. A long-standing view held by geneticists is that the individual groups of these species are so genetically unique that they should be maintained as such, however Dr Weeks believes their uniqueness is the result of random genetic drift and not beneficial for the survival of the species. He is therefore addressing the problem with genetic rescue, which involves re-establishing the gene flow between distinct populations of the same species. Initially there was

pushback, due to concerns that the progeny would be less fit than their parents – a situation known as outbreeding pressure. But this particular method of genetic rescue has been extensively utilised successfully in agriculture with no long-term implications, and so Dr Weeks proceeded to set up genetic rescue projects for threatened species.

Dr Weeks' projects involve introducing individuals from one population into another in the hope that they will mate, thus increasing the population size as well as outbreeding any deleterious alleles that can accumulate with inbreeding. **Mountain pygmy possums** currently exist as three isolated populations in the Victorian alpine region, and the population at Mt. Buller declined rapidly after the installation of a ski lift right through the middle of their habitat. A lack of males meant that at one point their ratio of male to female possums was 1:20, and a sharp decline in their genetic health paralleled this demographic collapse.

With the introduction of a predator control program and a culture shift at Mt Buller Ski Resort to prioritise protection of threatened species, the population bounced back slightly… but not enough. In October 2011, there were only a handful of possums left on Mt Buller when Dr Weeks brought six males over from Mt Hotham to encourage gene flow. As early as the summer of 2012, 50% (8 of the 16) of the population were hybrids from the two mountains, the offspring were larger in size, and had a 2.5 times greater fitness compared to their parents. Over time, the population at Mt Buller has continued to recover and spread across the mountain.

Dr Weeks also organised a similar project for the **eastern barred bandicoot**, crossing Victorian and Tasmanian populations by releasing five Tasmanian eastern barred bandicoots into fenced enclosures that protect the Victorian animals. This project also resulted in larger progeny and an increase in genetic diversity by 80%, but he aims to introduce even more from Tasmania as he predicts that bringing a total of 20 Tasmanian eastern barred bandicoots into Victoria will give the population a sustainable future.

Dr Andrew Weeks with RSV Councillors A/Prof Rob Day (Chair) and Dr Bill Birch (vote of thanks)

The future of biodiversity conservation relies on multiple factors, including removing native animals from the dangers of introduced predators, changing the culture of clearing land, and having support of the government, conservationists, and society as a whole. These changes would help populations to recover, however when the gene pool of a species has bottlenecked so much, even if the population size increases their genetic health will remain poor. To avoid the current health problems such as all koalas having chlamydia and Tasmanian devils having infectious facial tumours, genetic rescue is

potentially the solution. With Dr Weeks and his colleagues leading the way, endangered and threatened Australian flora and fauna will hopefully flourish again.

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[i] The Australian Government Department of the Environment and Energy, *Environment Protection and Biodiversity Conservation Act 1999*, http://www.environment.gov.au/biodiversity/threatened/species .

[ii] Orsini L, Corander L, Alasentie A, Hanski I 2008, 'Genetic spatial structure in a butterfly metapopulation correlates better with past than present demographic structure', *Molecular Ecology*, vol.17, no.11, pp.2629-42.

[iii] The International Union for Conservation of Nature's Red List of Threatened Species, https://newredlist.iucnredlist.org/

Memes and Tremes

By Catriona Nguyen-Robertson MRSV
RSV Science Communications Officer

The following article is a meme. It follows a presentation to the Royal Society of Victoria and the Australian Skeptics on 11 October, 2018 by Dr Susan Blackmore, a Visiting Professor at the University of Plymouth, whose ideas and story are to be shared with you and spread between people, should you choose to pass them on.

Please note that some examples used for clarity and food for thought are focused on Christianity – not for any reason other than this is the religion most familiar to the author.

In the 1970s, Professor Susan Blackmore had an "out of body experience". Afterwards, she wanted to understand it. She studied psychology and physiology at Oxford University, following which she completed a Master's of Science and Doctor of Philosophy in parapsychology - clairvoyance, telepathy, tarot cards, etc. - which is what made her stop believing in the paranormal. As a Doctor in psychic powers, she was worried that "there was no way [she] was going to get a normal job…or any job", but she switched her research interests to include evolutionary theory, memes, and consciousness to become a freelance writer and lecturer. After impressing the School of Psychology at the University of Plymouth as a guest lecturer, she was granted Visiting Professorship, and now dedicates her time to thinking, reading, and writing. Perhaps her ideas will expand your mind, encouraging you to do some thinking yourself.

Blackmore was diagnosed with chronic fatigue in 1995 and spent the year in bed, during which time she re-read Richard Dawkins' book on evolution, *The Selfish Gene*. During this time, she expanded on his ideas and the concept of Universal Darwinism to write *The Meme Machine*. Charles Darwin's explanation of the *Origin of Species* in 1859 states that if there is variation among individuals and a struggle for life where some variants are more likely to survive than others, those at an advantage will be

more likely pass their genes to offspring while other variants are weeded out, hence making evolution inevitable. Dawkin's idea is thus centred on genes being "selfish replicators", not in that they are driven by motives, but in that they simply carry information that is designed to be replicated without concern for the evolutionary consequences.

Genes have existed since the origin of life on Earth, and Dawkins proposes that they are the first *replicators* – the original replicator being the initial molecule that managed to reproduce itself, gaining an advantage over other molecules. As replicating molecules became more complex, the replicators became instructions to create organisms. Once our human ancestors became capable of imitation, another replicator emerged; Dawkins coined the term 'meme' (shortened from *mimeme* – that which is imitated) to apply to this second replicator: an idea, behaviour, story, or other information that spreads to person to person through speech, writing, gestures, rituals, etc.. Dawkins and Blackmore theorise that memes undergo a process of evolution analogous to that of biological evolution and natural selection, in that they undergo variation and competition for space in our memories for the chance to be copied and spread. Because only some of the variants of information survive and are not forgotten, memes and in turn, human cultures, evolve. The Christian Bible for example contains four Gospels – Matthew, Mark, Luke, and John - all telling the life of Jesus Christ in different ways through a selection of teachings. Furthermore, only four Gospels were recognised and selected by the church, but other Gospels have existed, highlighting that some memes survive and are remembered while others fade. According to Blackmore, "we are the meme machines" because we create memes, people copy and vary them, and others chose to pass them on.

What makes a meme succeed? Some memes succeed because they are true, beautiful, or useful, while others are more viral in nature (e.g. chain letters and pyramid schemes), exploiting threats or promises to spread. Religion holds some of the most successful memes, having been passed down for centuries, and are the prime example of memes influencing human behaviour: to Blackmore, they are "viruses of the mind" that "cause people to do strange things" based on promises (e.g. A Christian's good behaviour is rewarded by going to heaven while sin condemns one to hell). Other memes, such as science, arts, sports, and communication systems, succeed because they are valuable to us, and some relatively harmless memes (with occasionally questionable value) can also spread like wildfire through the population such as rumours, popular songs, and games. Advancements in transportation and

technology – memes themselves - have drastically improved the spread of memes around the world; many religions are much more widespread with the movement of people between countries, and the internet provides a platform to rapidly share music, ideas, knowledge, etc.

Blackmore proposes that there may be a third replicator emerging, created by the machines that we generated with the second. For a long time she has wondered whether there was a difference between traditional memes (the actions we copy, the languages we communicate with, etc.) and technological memes, or "tremes", and the answer is becoming increasingly clear to her. To become a truly distinct replicator, digital information (text, images, software, etc.) needs to be copied, varied, and selected independently of humans, and this is now a reality. Since the time Blackmore first spoke about the idea of a third replicator (her TED talk can be viewed at https://www.ted.com/talks/susan_blackmore_on_memes_and_temes/), technology has evolved rapidly as we provide machines with increasingly efficient processing power, to the point where we aren't required in the transfer of information. Amazon and Google, for example, have software that allow programs to filter, vary, and select advertisements tailored to their user's history. Robots have even communicate with each other in their own language as demonstrated by Facebook artificial intelligence robots, which originally communicated in English but developed their own, more efficient language over time. These advancements indicate that, while "we provide all the stuff on which this operates" (i.e. the hardware and program codes), we're no longer fully in control of the motives of artificial intelligence.

Blackmore's intentions are not to force her beliefs onto us – but rather to stretch our minds and decide for ourselves whether or not we agree with the idea of a third, technological replicator. She also evoked the question of how much of a "meme machine" we are, in terms of how much we imitate and take from other people, and of that, and how much we choose to pass on. "We're bombarded with memes all day" (stories, the news, other people's habits, and of course, internet memes), some of which we adopt in our own behaviour or tell others about. I know my character and mannerisms are a compilation of various influences around me. I also listened to Blackmore's presentation myself at the Royal Society of Victoria and decided to share her ideas in my own words to be read by you – and that is why this article is yet another meme.

Dr Susan Blackmore with Victorian President of the Australian Skeptics, Chris Guest, with RSV Councillors Dr Kevin Orrman-Rossiter (Chair) and Pamela Borger (vote of thanks)

Research Spotlight

with Priya Mohandoss MRSV

Mrs Anindita Samsu

2018 YSRP Prize Winner for Earth Sciences

Research topic: "Do fractures have ancestors?"

After completing both Bachelor and Master's degrees in the field of Geosciences in Austria, Anindita began a PhD at Monash University in the field of structural geology, in particular, analysing how rocks can deform in a brittle manner.

Anindita was interested in mapping fractures, or cracks, in rocks. These are records of the stretching or squeezing that rocks have been exposed to as a result of plate tectonics. Along with her supervisor, Professor Sandy Cruden, they both decided to investigate the geological phenomenon of structural inheritance, utilising the coastal area of the Gippsland Basin as their location. In order to accomplish this, Anindita used a suite of data that encompassed of regional geophysics as well as high-resolution aerial images that were acquired with drone technology. This then allowed her to accumulate a detailed comparison of fracture patterns across the scales.

Her efforts in recognising the influence of the older "basement" rocks on fracturing in the overlying rocks can be used to understand the distribution and geometries of surface ruptures caused by earthquakes past and present. Furthermore, the analysis of natural fracture patterns provides fundamental clues to the transport and accumulation of water, gas, oil, and mineral-bearing fluids in the crust. As a result, this leads to significant economic implications for natural resource exploration.

In the future, Anindita plans to continue her work through facilitating with industry-related projects or moving onto a research and development role. She is also considering doing a post-doctorate in her chosen field of structural inheritance in order to further her current research.

Mr Aidan Kashyap

2018 YSRP Prize Winner for the Biomedical and Health Sciences

Research topic: "Improving the transition to newborn life for babies with congenital diaphragmatic hernia"

After four years of medical school at Monash University, Aidan decided to enter the world of research with a Bachelor of Medical Science (Honours) project in maternal-foetal medicine. Under the guidance of A/Prof Ryan Hodges, Aidan began to investigate new therapies for babies with Congenital Diaphragmatic Hernia (CDH). After realising the significance of the work and impact of the

condition, he then decided to convert his line of research into a PhD.

In babies with CDH, the diaphragm fails to form properly during early fetal development. This allows the stomach to enter the chest, leaving no space for the lungs to grow and develop. After birth, these babies have great difficulties in breathing on their own. Consequently, 20-30% of babies with CDH die, and in severe cases, the expected survival is less than 15%.

At The Ritchie Centre (Hudson Institute of Medical Research), a world leader in research on fetal and neonatal physiology, Aidan's work has focused on how babies with CDH transition to newborn life. During the past three years, in conjunction with his supervisors, Aidan has assisted in developing and refining a sheep model of CDH. This model allows the research team to deliver lambs with CDH and identify the physiology underlying their problems during the transition to newborn life. As sheep fetal lung development is similar to humans, they are appropriate to use for this type of experimental research.

Using this pre-clinical model, Aidan and his supervisors have examined many innovative ante-natal and neonatal treatments to improve lung function after birth. These are:

a) Tracheal occlusion, also called "FETO" is a surgical technique that aids in enlarging fetal lungs during pregnancy;

b) Treating the mother with sildenafil, a vasodilator that can be prescribed before birth to allow the baby's blood vessels in the lungs to develop better during fetal life and therefore function better in the stages of newborn life;

c) Delaying umbilical cord clamping until after the lungs are filled with air to allow these lambs to more gradually transition after birth while still supported through their mother's placenta.

From these, delaying umbilical cord clamping, the most simplest of the three interventions, proved to be the most promising. This important pre-clinical research will now inform future analytical trials and when implemented into practice, is likely to improve the effects for many babies with CDH and their families.

Once completing his combined MBBS/PhD degree, Aidan will begin his career as a clinician-scientist, generating research from clinical problems, investigating them in the laboratory and then incorporating these results back into practice. Aidan will spend some time overseas to develop new perspectives, however, would ultimately like to further his career within Melbourne.

CDH Australia will be holding their annual CDH Awareness Walk on Sunday November 11, to raise awareness and show support for members of the CDH community. For more information, please visit: http://cdh.org.au/cdh-sunflower-sunday-2018/.

Miss Victoria E Coyle

2018 YSRP Prize Winner for the Physical Sciences

Research topic: "Nickel-gold bimetallic monolayer colloidal crystals fabricated via galvanic replacement as a highly sensitive electrochemical sensor"

Victoria decided to concentrate her efforts on doing a PhD to produce a sensor that could detect blood glucose concentrations of a low range for those with type 1, type 2 and gestational diabetes. Currently, 1.7 billion Australians have some form of this disorder.

She applied the methods of material science and nanotechnology to form the material for her sensor and electrochemistry to determine glucose concentrations. In doing this, she

discovered that the combination of a nickel and gold alloy sensor produced the most effective results in terms of monitoring the sensitivity and selectivity of blood glucose.

At the moment, enzyme-based glucose sensors are the most common. However the sensor Victoria, along with her supervisors, (Prof Suresh Bhargava, Assoc. Prof Miao Chen, Dr Ylias Sabri and Dr Ahmad Kandjani) and the team at RMIT University developed is made from metal-based structures which have the benefits of being biocompatible and have the capability to be placed on flexible materials. The latter allows for the possibility for wearable devices, such as wrist watches to be used in analysing glucose concentrations in sweat. More importantly though, these new devices have no painful side effects for the user.

After presenting her research, Victoria has gained more insight into the heightened level of interest in the field of materials science. In addition, she wants to take her PhD further and focus on real-time sensing before finally consolidating this technology into a patented form that would be ready for commercialisation.

With exciting research in materials science being performed in USA, Switzerland, Germany and China, Victoria is now considering going overseas to investigate if there are further opportunities to take this project to the next level. Hopefully after this time she will be able to bring this knowledge back to Australia and continue to make her mark in materials science and bio-sensing.

* * *

Our grateful thanks to Priya for these terrific profile pieces on our Prize winners! A final profile on the Biological Sciences winner, Axel Newton, will follow in December. - Mike

Inspiring Australia Science Engagement Grants

Advance notice that Maker Projects grants are opening in the forthcoming days, on **Thursday 8 November** from 12 noon AEDT. These grants are in extremely high demand and full subscription is anticipated, so it's worth getting ready with your submission as early as possible.

The grants help Australian primary and secondary schools build their very own maker spaces through the Stream A Grants. Meanwhile, the Stream B Grants help organisations to hold STEM-related events and education activities, delivered in partnership with industry and aimed at youth under 18 years of age.

More information is available online at https://www.business.gov.au/assistance/inspiring-australia-science-engagement

Further, large grants for events during National Science Week 2019 are still open for applications until **20 November**. Please contact us if you would like to discuss your ideas, or seek help with partnerships and auspicing. Details are online at https://www.scienceweek.net.au/national-science-week-grants-for-2019/ .

The Royal Society OF VICTORIA
Promoting science since 1854

CALL FOR NOMINATIONS:
RSV COUNCIL ELECTION FOR 2019-2020

Nominations are hereby called for the election of the following positions for the 2019-20 Council:

President, Vice-President, Treasurer, Secretary and Five Ordinary Councillors

Four Office Bearers and up to five Ordinary Members of Council for 2019 and 2020 will be elected by postal ballot closing at 3.30pm on **4th March 2019**. The elected Councillors will take up office from the Annual General Meeting to be held 9th May, 2019. All current 2017-18 Councillors will continue until that date.

Note: *the following Ordinary Councillors are not required to re-nominate as their two-year term continues through 2019:* A/Prof Gavin Smith, Dr Kevin Orrman-Rossiter, Dr Sophia Frentz, Dr Julie Boyce, Dr Catherine de Burgh-Day.

Note: *Rule 22 (3) Council shall consist of no more than ten ordinary members of Council, five of whom shall be elected to take office in odd-numbered and five in even-numbered years, from whose number Council shall appoint persons to such Special Positions as shall be determined by Council from time to time to be necessary for the proper conduct of the Society's business.*

Note: *In 2019-20 the Special Positions will be the Chairs of the following Council Committees: Membership & Mentoring; Publications, Collections & Records; Science Program; Science Outreach & Partnerships; Science Policy & Communication.*

Note: *The Returning Officer for the 2019-20 RSV Council Election will be Emeritus Professor James Warren (Deputy: Dr Douglas McCann),*

The Nomination Form is distributed with this Notice. It must be returned, attention to the Returning Officer, along with the nominee's 200 word statement by **3.30 pm, Monday, 17th December 2018.**

Nomination criteria & guidelines:

1 Nominees for Officer or Councillor Positions must be Financial Members of the Royal Society of Victoria at the closing date of nominations and, in accepting nomination, undertake to maintain their RSV membership status throughout the election process and any subsequent tenure on the RSV Council.

2. Nominations may only be made and seconded by Members of the Society who are financial at the closing date of nominations.

3. A member may be nominated for only one Officer or Councillor position.

4. The nomination, including the consent of the candidate, must be accompanied by a statement of not more than 200 words in length prepared by the candidate or the nominator. Any statement exceeding 200 words will render the nomination invalid.

5. Each statement must be submitted on plain paper; company or business letterhead will not be accepted. **An electronic copy as a Word document must also be lodged with the Returning Officer via:** rsv@sciencevictoria.org.au

6. All nomination forms and statements must reach the Returning Officer, c/o The Royal Society of Victoria, 8 La Trobe Street, Melbourne 3000 **by 3.30 pm on 17th December 2018**, this being the closing time and date for nominations.

7. A candidate may withdraw from the election for any of the positions for which he or she has been nominated.

8. In the event of uncontested positions, the Returning Officer will declare the results for those positions immediately; and state that an election for these positions is not required. Results will be published on the Society website and in the Newsletter distributed at the end of January 2019.

9. If more than one nomination is received for any Officer, the Returning Officer must conduct an election for that position.

10. If there are more nominations than the number of vacant Ordinary positions of Council, the Returning Officer must conduct an election for all of the vacant positions.

11. A notice of the calling of an election and ballot papers will be circulated to financial members with the Newsletter in late January 2019. The Notice will be placed on the Society's website and on the notice board in the Society's premises displaying the nomination forms.

12 The notice of the election and Ballot Paper sent to members will be accompanied by the nominee's 200 word statement. These will be the only election materials authorised by the Society.

Nomination Form Overleaf

NOMINATION FOR ELECTION TO RSV COUNCIL 2019-2020

We hereby nominate _____

of _____

who is a member of the Society, for the position of (CIRCLE ONE):

President

Vice-President

Honorary Treasurer

Honorary Secretary

Ordinary Councillor

I consent to the above nomination.

Signature of Candidate _____ Date _____

I submit with this nomination form a Statement not exceeding 200 words in length to be displayed on the Notice Board in the Society's premises and website and if a ballot is necessary, circulated to the members. This Statement is a mandatory part of the nomination requirement.

Nominated by:

Name _____Signature _____Date_____

Address _____

Seconded by:

Name _____Signature _____Date_____

Address _____

This nomination must reach the Returning Officer by 3.30pm on the third Monday of December, care of the Royal Society of Victoria, 8 La Trobe Street, Melbourne, Victoria 3000. **Please check the nomination criteria and guidelines to ensure your submission complies with all requirements.**

Please use a separate form if nominating more than one member for a position. Only one nomination per officer position and five nominations for the ordinary councillor positions will be accepted per nominating member. Further forms are available online from https://rsv.org.au/rsv-council-nomination-form-2019-20/ .