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…

3rd April: *"Ockham's Razor: LIVE from the Royal Society of Victoria"* **(ABC Science)**

Featuring ***Natasha Mitchell (MC), Dr Jenny Gray, Dr Kiri Beilby, Dr Tien Huynh, Professor Jon McCormack and more!***

11th April: *"Moneyball 2.0: Analytics and Technologies Improving High-Performance Sports"*

A/Professor Sam Robertson & Professor Damian Farrow

RSV Easter Close: 19 – 22 April
ANZAC Day Close: 25 April

Advance Notice

5th May: "*For the Love of Science"*

A Science Nation event

9th May: ***RSV AGM****, followed by: "Gamble, Drink, Consume, Repeat: Why we need BrainPark"*

Professor Murat Yucel

15th May: *"Science Gossip: Woodland Rumours and Thinking Trees"*

Featuring ***Dr Monica Gagliano, Ms Anna Madeleine, Ms Vicki Hallett, Dr Sapphire McMullen-Fisher and Adjunct Professor Freya Mathews***

23rd May: *"Are Bees Smart Pollinators? You can count on it"*

A/Professor Adrian Dyer

April 2019 Newsletter

Print Post Approved 100009741

The Royal Society of Victoria Inc.
8 La Trobe Street,
Melbourne Victoria 3000
Tel. (03) 9663 5259
rsv.org.au

Ockham's Razor: LIVE at the Royal Society of Victoria

Wednesday, 3rd April 2019 at 7:00pm

After a stellar event in 2018, **ABC Science** returns to the Royal Society for a special podcast recording event. *Ockham's Razor* is the ABC's soapbox for all things scientific: stories, insights, arguments or tributes – anything that can grip an audience by the ears for 10 straight minutes.

You'll hear from a hand-picked roster of superb speakers plus the ABC's own Natasha Mitchell. Expect a jam-packed evening of short talks that will intrigue, excite and inspire, including:

- Collaboration and creativity with Artificial Intelligence — **Professor Jon McCormack**, Monash University
- Post-menopausal nuns in the Vatican, global pharmaceuticals, and getting pregnant in the 21st century — **Dr Kiri Beilby**, Monash University
- The future is fantastic with fungi — **Dr Tien Huynh**, RMIT University

…and more to come, including Zoos Victoria CEO, **Dr Jenny Gray**!

Places limited, bookings essential! *Cocktail function from 6:00pm.* **Register online** now at https://rsv.org.au/events/ockhams-razor-2019/, call or email the RSV office to secure your place: 9663 5259, rsv@rsv.org.au. Fully subscribed **RSV Members** can access discounted tickets by registering via their online profile, or call the RSV office to access their **discount code**.

Moneyball 2.0: Analytics & Technologies Improving High-Performance Sports

Thursday, 11th April 2019 at 7:00pm

Speakers:

Associate Professor Sam Robertson
Head of Research & Innovation, Victoria University/Western Bulldogs

Professor Damian Farrow
Game Insight Group, Institute of Health & Sport, Victoria University/Tennis Australia

The release of the highly influential book *Moneyball* in 2004 marked an increase in interest in the use of analytics for operational decision-making in professional sport. Now, 15 years later, the use of data, technology and analytics to produce actionable insights for application in sport has diversified considerably.

Technology advancements are creating new types and sources of data available to both sports researchers and practitioners alike. Fast computing and algorithms are allowing for the high volume of data obtained via vision and sensors to be almost automatically

converted into usable information, ready to be translated into sporting practice. Examples include: kick evaluation ratings in Australian Rules football using player GPS data, the Emotion Tracker – to understand the role of player facial expressions in tennis and real-time models to predict anything from player injury to the outcome of games.

In this lecture, Dr Sam Robertson (Victoria University and the Western Bulldogs) and Professor Damian Farrow (the Game Insight Group, joint initiative between Tennis Australia and Victoria University) discuss how the future of analytics will continue to change the way pro teams, broadcasters and fans enjoy and experience sport.

About the Speakers:

Associate Professor Sam Robertson oversees the sports science partnership between Victoria University and Western Bulldogs. Sam supervises co-appointed staff, PhD and Honours students, as well as implementing innovative performance strategies at the club.

Prior to arriving at the university, Sam worked as a sport scientist in various institute roles in both Australia and the United Kingdom. He returned to Australia to undertake multiple applied roles in Australian football and golf.

He completed his PhD at Edith Cowan University in skill acquisition & talent identification as part of his role in Research and Innovation with the Golf Australia High Performance program. Prior to commencing at VU, Sam also held an ongoing position as the Lecturer in Biomechanics at Deakin University.

Due to his multidisciplinary applied background, Sam maintains a variety of research interests related to improving sporting performance. These interests predominantly cover Performance Analytics & Technology, Talent Selection, Development & Coaching Practice themes in Australian football and golf.

Professor Damian Farrow is the AFL Umpiring Coaching and Innovation Manager. He also holds a fractional appointment within the Institute of Health and Sport at Victoria University where he manages the Game Insight Group (GIG), a joint initiative between Tennis Australia and Victoria University.

In 2002 he was appointed the inaugural AIS Skill Acquisition Specialist, then became the Discipline Head of Psychology and Skill Acquisition in 2009. In this position he was responsible for research and support of coaches seeking to develop the skills of Australian athletes.

He has worked with a range of AIS and National sports programs including the AFL, Cricket Australia, Tennis Australia, Swimming Australia, Netball Australia, Surfing Australia, the Australian Rugby Union and is currently National Lead of Skill Acquisition for Swimming Australia.

Damian publishes and presents extensively on his research interests, centred on understanding the factors critical to the development of talent and sport expertise, with a specific focus on perceptual and decision-making skill and practice methodology.

A former tennis coach and physical education teacher, he is passionate about community engagement through the translation of theory into practice via coach education and the publication of general interest sports science books including; *Run Like You Stole Something*, *Why Dick Fosbury Flopped* and *It's True: Sport Stinks.*

Places limited, bookings essential! *Cocktail function from 6:00pm.* **Register online** now at https://rsv.org.au/events/moneyball-2-0/, call or email the RSV office to secure your place: 9663 5259, rsv@rsv.org.au. Fully subscribed **RSV Members** can access discounted tickets by registering via their online profile, or call the RSV office to access their **discount code**.

Gamble, Drink, Consume, Repeat: Why we need BrainPark

Thursday, 9th May 2019 at 7:00pm

Speaker: Professor Murat Yücel

David Winston Turner Chair in Addiction & Mental Health
Monsah Institute of Cognitive & Clinical Neurosciences
Director, BrainPark

Australians have some of the highest rates of addiction-related problems in the world. Treatment services are often over-stretched, inaccessible, or ineffective. At the same time, revolutionary neuroscientific discoveries have revealed how lifestyle and technological interventions can improve brain health and psychological wellbeing. While these discoveries hold enormous therapeutic promise, we have done a poor job of integrating them into practice.

The recently established BrainPark at Monash University brings together some of the nation's best neuroscientists, mental health experts, exercise physiologists, behavioural interventionists, biomedical engineers, technology developers, data analysts, business strategists, and neuroethicists. Learn how researchers and their industry, healthcare and community partners are working to create a world-first convergence of advanced technologies (brain imaging, virtual-reality, brain stimulation, neuro/bio-feedback, wearables) and lifestyle activities (physical exercise, brain training, mindfulness).

Join us, as Professor Murat Yücel discusses how he and his colleagues at BrainPark utilise the latest knowledge in brain sciences to develop lifestyle and technology-based interventions to help those experiencing substance and behavioural addictions (e.g., alcohol and gambling) and other compulsive conditions (e.g., OCD), and to measure the underlying psychological drivers of addictive behaviours that place individuals at risk of developing and/or maintaining those behaviours.

About the speaker:

Professor Murat Yücel has a PhD combined with specialist clinical training in Clinical Neuropsychology. He is an NHMRC Principal Research Fellow, the David Winston Turner Chair in Addiction and Mental Health, and he currently leads the Addiction and Mental Health research program within the Monash Institute of Cognitive and Clinical Neurosciences.

His research group combines lifestyle, psychological and technology-based interventions to improve outcomes for people with (or at the borders of) addictions and obsessive-compulsive disorder. In 2018 Professor Yücel established BrainPark, a world-first research facility using neuroscience to create healthy habits, brains and lifestyle, and to fast-track knowledge into the community.

Places limited, bookings essential! *Cocktail function from 6:00pm.* **Register online** now at https://rsv.org.au/events/gamble-drink-consume-repeat/, call or email the RSV office to secure your place: 9663 5259, rsv@rsv.org.au. Fully subscribed **RSV Members** can access discounted tickets by registering via their online profile, or call the RSV office to access their **discount code**.

Science Gossip: Woodland Rumours & Thinking Trees

Wednesday, 15th May 2019 at 7:00pm

Wander the heritage rooms of the Royal Society of Victoria, discovering new ideas, hypotheses, and research findings presented through 19th century salon-style discussions, exhibits and performances. Come catch up on some **Science Gossip!**

Our inaugural Science Gossip event, *Woodland Rumours and Thinking Trees,* plants artists and philosophers in common ground with scientists working to unravel the secrets of forest communication, connection and community. Through discussions, musical performance, and art installation we invite you to consider the inner lives of trees, and re-examine your relationship with them.

Science Gossip: Woodland Rumours and Thinking Trees is part of ART+CLIMATE=CHANGE 2019 presented by CLIMARTE.

SPEAKERS and PRESENTERS:

Short presentations and interactive activities will be presented by a selection of scientists, artists, and philosophers.

Keynote introduction by Dr Monica Gagliano

Monica Gagliano is Research Associate Professor of Evolutionary Ecology. She is currently based at the University of Sydney as a Research Affiliate at the Sydney Environment Institute and a Senior Research Fellow at the School of Life and Environmental Sciences, opening the doors of the brand-new BI Lab – Biological Intelligence Lab. She is the author of the new book *Thus Spoke the Plant*, numerous scientific articles in the fields of animal and plant behavioural and evolutionary ecology, and is the co-editor of *The Green Thread: Dialogues with the Vegetal World* (Lexington Books, 2015) and *The Language of Plants: Science, Philosophy and Literature* (Minnesota University Press, 2017). Her work has extended the concept of cognition (including perception, learning processes, memory and consciousness) in plants. Gagliano has pioneered the brand-new research field of plant bioacoustics, for the first time experimentally demonstrating that plants emit their own 'voices' and, moreover, detect and respond to the sounds of their environments. We are offering discounted presale copies of Monica's book, to be signed by the author on the night. For more information about her work, visit: www.monicagagliano.com.

Ms Anna Madeleine

Anna Madeleine is an artist working with AR, VR, drawing, animation and installation, to explore intersections between art and science. She has a PhD in Media Arts from UNSW Art & Design (2014) and is a Lecturer in Printmedia & Drawing at ANU School of Art & Design. She has had solo exhibitions in New York, Melbourne, Sydney, Canberra, Montreal and Bandung, and participated in residencies with Cité Internationale des Arts, Paris, Bundanon Trust, Asialink Arts, and the School of Cinematic Arts, University of Southern California, Los Angeles.

Ms Vicki Hallett

Vicki Hallett is a clarinetist, composer and sound artist who graduated from the Victorian College of the Arts and the University of Melbourne. She has composed, produced and performed in live concerts, solo recordings ranging from chamber music to sound art and acoustic ecology. Through a unique approach, combining acoustic ecology, scientific analysis and innovative performance practices, Vicki reshapes the role of interdisciplinary research. This exploration has led her to develop a collaborative concept with Cornell University's *Elephant Listening Project.* In 2017, Vicki attended the international residency, Sonic Mmabolela, where she performed on Mabolel Rock with a pod of Hippopotami.

Dr Sapphire McMullan-Fisher

Sapphire is an ecologist with a special interest in the conservation of biodiversity, particularly the macrofungi and mosses. She received her doctorate from the University of Tasmania and has been actively involved with coordinating citizen science organisation Fungimap since 1999. She is the regional representative for Australasia for the *International Society for Fungal Conservation*, and is active with community groups including field naturalist clubs and Landcare groups. Having lived in four states and travelled across Australia's landscapes she has worked with many fungal community groups to raise the profile of local fungi and the important roles fungi play in our environment. She works as a mycologist with the Royal Botanic Gardens Victoria.

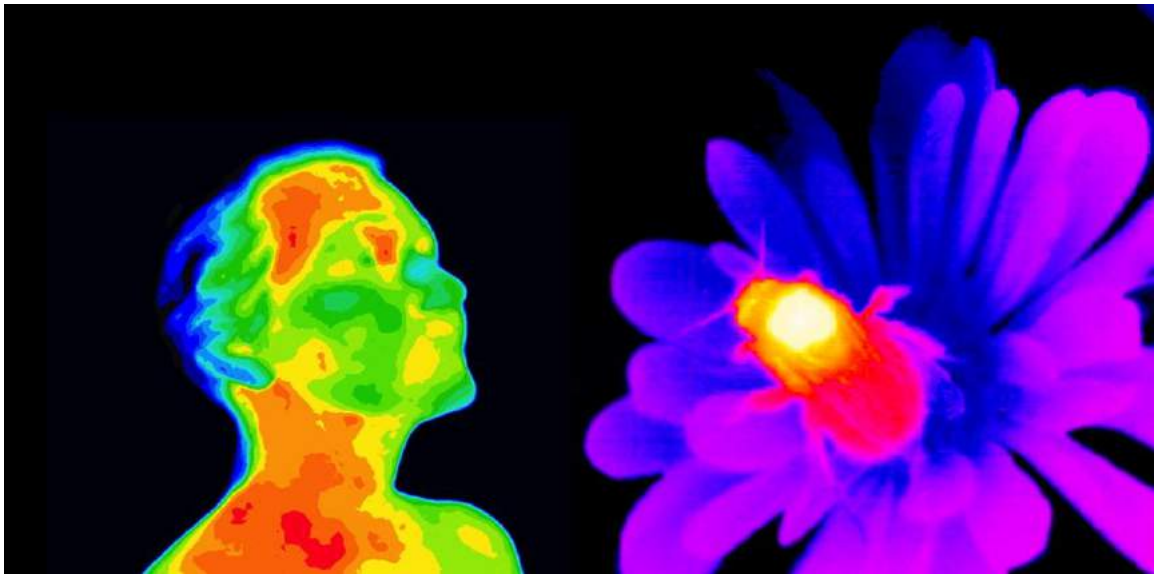
Adjunct Professor Freya Mathews

Freya Mathews is Adjunct Professor of Environmental Philosophy at Latrobe University and a fellow of the Australian Academy of the Humanities. Her books include *The Ecological Self* (1991), *Ecology and Democracy* (editor) (1996), *For Love of Matter: a Contemporary Panpsychism* (2003), *Journey to the Source of the Merri* (2003), *Reinhabiting Reality: towards a Recovery of Culture* (2005), *Ardea: a philosophical novella* (2015) and *Without Animals Life is not Worth Living* (2015). She is the author of over eighty articles in the area of ecological philosophy and panpsychism. In addition to her research activities she co-manages a private conservation estate in northern Victoria.

Places limited, bookings essential! Food and beverages served throughout the evening. **Register online** now at https://rsv.org.au/events/science-gossip-2019/, call or email the RSV office to secure your place: 9663 5259, rsv@rsv.org.au. Fully subscribed **RSV Members** can access discounted tickets by registering via their online profile, or call the RSV office to access their **discount code**.

Are Bees Smart Pollinators? You can count on it!

Thursday, 23rd May 2019 at 7:00pm



Speaker: Associate Professor Adrian Dyer

QEII Research Fellow, Department of Physiology, RMIT University

To recognise objects a brain must have an internal representation of their most likely appearance. Two ways in which brains may possess this information include a hard wired template system, and/or the neuroplasticity to learn novel objects. Recent investigations on honeybee vision show that this animal can learn to recognise very difficult objects, although currently we do not know how the miniaturised bee brain, with just 0.01% of the number of cells found in a human brain, manages these tasks.

Bees use their ultraviolet, blue and green colour vision to efficiently find flowers in complex environments. Associate Professor Dyer's research testing of how environmental factors, like changes in climate, might affect the way in which bees choose to visit certain flower types, including plants that have important environmental and economic impacts. He seeks to reveal changes that occur in the processing of visual objects by the bee's brain with increasing experience, with potential applications including robotics or building interfaces between sensors and biological systems. The research can also reveal how colour information is processed by bees, which informs computer models to evaluate how novel solutions might be applicable for robotic vision.

About the Speaker:

Associate Professor Adrian Dyer is a vision researcher at RMIT University investigating how both the introduced honeybee and native bees perceive colour, and how this has affected the evolution of flowers. He completed a PhD in 2000 (RMIT University) and was a Humboldt Fellow (Germany), a La Trobe Fellow (La Trobe University) and an Australian Research Council Fellow (Monash University).

He also held postdoctoral research positions at Cambridge University, and collaborates extensively with universities in France and the USA. His research has been published in leading journals including *Nature*, *Science* and *Proceedings of the Royal Society*; and has been featured on ABC TV as well as numerous international media outlets like *The New York Times* and the *BBC*.

Places limited, bookings essential! *Cocktail function from 6:00pm.* **Register online** now at https://rsv.org.au/events/smart-pollinators, call or email the RSV office to secure your place: 9663 5259, rsv@rsv.org.au. Fully subscribed **RSV Members** can access discounted tickets by registering via their online profile, 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 Jake **MARTIN**, PhD candidate, Monash University
Mr Kamyar **SHIRVANI MOGHADDAM**, PhD candidate, Deakin University
Dr Jenny **GRAY**, CEO, Zoos Victoria
Mr Andrew **MARTY**, Managing Director, SACS Consulting
Professor Allan **RODGER**, Sustainability Consultant, University of Melbourne
Dr Titus Franciscus **SCHEELINGS**, PhD candidate, Monash University
Mr John Frederick **WEST LAU**, Retired
Dr Joshua **SODERHOLM**, Meteorologist
Mr Graeme Dean **BERK**, PhD candidate, 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 9th May 2019. Recently elected members who have not yet signed the Society's membership book are warmly invited to attend the 11th April 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.**

Slack for RSV Members

A reminder to RSV members that invitations to join the Society's Slack channel, an online discussion forum, have been sent to all members with an email address on file.

Following our members' conference in early February, this will provide a platform for all members to have input to the Society's various programs and plans; the current consideration concerns our site's redevelopment, and its alignment with our mission and purpose.

Please check your inbox for the invitation, or contact us at rsv@rsv.org.au if you need a new one.

Valete

The Society's Council, Officers and staff mark with sadness the passing of the following RSV members:

Professor Owen White MRSV

18/1/1926 – 23/6/2018

Professor White was a past president of the International Association for Engineering Geology and the Environment, a recipient of the Association's Hans Cloos Medal and a Thomas Roy Award from the Canadian Geotechnical Society. An international member of the Royal Society of Victoria since 1995.

Mr Wallace Mobilia MRSV

15/2/1923 – 13/1/2019

A member of the Royal Society of Victoria since 1971, missed at our events in recent years due to infirmity.

Our belated condolences to Owen and Wallace's surviving family, friends and colleagues.

For the Love of Science

A Science Nation Event @ RSV
Sunday 5 May, 3.00pm

In the era of 'alternative facts' the need for scientists to share what they learn with others has never been more important. To find out how well actual facts are being shared from the source, the Science Nation is going to quiz a panel of scientists and their partners to find out just how much information is transmitted. Join the Science Nation in May for some fun and to learn a thing or two as we put love and science to the test.

Places limited, bookings essential! Register online now at:
https://www.trybooking.com/BBRWT.

From the Acting President

As our president, David Zerman, is still recovering from his left hip replacement, I'm writing this brief report. We continue to wish David a speedy recovery, so he'll be back with us very soon, and able to join in and enjoy the programs.

Our successful two day conference on planning the future of the RSV, involving participation from many members, has resulted in the creation of an online forum, where all members can comment on the 8 final themes which emerged. Comments and discussion are most welcome on the new SLACK channel, with some discussion threads established under #rsv2054. Please join in.

March has been very busy, beginning with a capacity audience for the second of our series on Victoria's Regional Forests Agreement, this one concentrating on the 'Conservation of Biological Diversity.' The problems, effects, and possible solutions for conserving species, from tiny aquatic bugs to old growth timber, were covered in detail by our five expert speakers, the audience responding with a lively Q&A session.

In the evening lecture on that same day, we were treated to a fascinating exposé of 'Origins: How the Earth Made Us,' by visiting University of Westminster Professor Lewis Dartnell, based on his book of the same name. Many of the packed audience realized, for the first time, how many of those maps and climate cycles from school geography classes actually made sense; though the derived relationship between underlying geology and voting patterns in the southern US was a surprise!

The following evening lecture was exciting in a completely different way, as four young (relatively) scientists working at the cutting edge of electronics/physics research explored with the audience the challenges and possibilities in moving up to, and beyond, the current understanding of Moore's law. Again, the lecture was followed by an active Q&A session.

This is also a reminder that the date of the AGM, 9th of May, is fast approaching. Items for the Agenda must be submitted to the Honorary Secretary (Dr Peter Baines), care of the Society, by 11th April.

Executive, and Council, would once again like to thank our CEO, Mike Flattley, the office staff, and the catering staff. They do a superb job under what are sometimes difficult circumstances.

- **Nicola Williams, Vice-President**

Videos of RSV Events

We try to professionally film as many of our events as possible to share with everyone. However (if you can excuse the dodgy camerawork of the CEO) you can access all this year's talks via "livestream" on our Facebook page. This means you can tune in to our talks as they're happening, and also watch the resulting video file on Facebook afterwards. These can all be viewed online at https://www.facebook.com/pg/royalsocietyvictoria/videos/ .

We also post our high-quality videos here as they become available; these include the full lectures, and also a ten minute 'digest' of key points along with interview material, thanks to the efforts of our science communications officer, **Catriona Nguyen-Robertson** and Science Week Lead, **Dr Renee Beale**. Catriona also writes up our key talks and events for you to review in our newsletters, and does wonderful work! Finally, our go-to videographer is **Mr Robert Cross**, who has a talent for editing complex content into coherent themes with an engaging format. We highly recommend his services.

- **Mike Flattley, CEO**

The Future of Electronics

by **Catriona Nguyen-Robertson MRSV**

This article follows a panel presentation to the Royal Society of Victoria on 14th March, 2019 from A/Professor Meera Parish (Monash), Dr Carlos Kuhn (Swinburne) and Ms Rebecca Orrell-Trigg (UNSW/RMIT), scientists working with the ARC Centre of Excellence in Future Low-Energy Electronics Technologies (FLEET), a new Australian research centre developing new generation, ultra-low energy electronics.

Prior to the 'silicon revolution' in the 1950s, electronic 'switching' was accomplished by giant glass vacuum tubes such as this one. In modern electronics, switching is accomplished by transistors – and 4 billion transistors, only nanometers big, now fit into a single smartphone!

Electronic devices have rapidly transformed the world. Computers, phones, and other silicon-based electronics have changed the way we live our lives. From only a few hundred computers in the 1950s, to 2.5 billion smartphones around the globe today, we're constantly demanding more, increasingly advanced technology…but can we keep up with the demand?

When discussing the advancement of technology, it is impossible to avoid Moore's Law, which predicts ever-smaller and ever-more efficient computer components.

The primary building blocks of electronic devices are transistors, which create the binary 0's and 1's that computers use to communicate. Moore's Law predicted that the number of transistors in microchips would double every two years. So far, the law has held up.

The number of transistors inside computer circuits continues to increase as their size decreases so as to pack in more without resulting in a mobile phone the size of a book. Transistors are currently as small as 14 nanometers in size – only six times thicker than the DNA in your cells – and we're reaching the limit of how small we can go.

Our uptake of newer technologies and electronics also comes at a cost: information and communications technology (ICT) consumes about 8% of global electricity, doubling every decade. A massive amount of energy is consumed in the thousands of factory-sized data centres that house "the cloud", as well as computer systems for telecommunication and storage. Most of the energy consumed in data centres, computers and other devices is dissipated as heat rather than being used to power the device itself, meaning that much of it is wasted. ICT is now on par with the aviation industry for their contribution to global warming, and it's time for a change.

Dr Kuhn demonstrated how electrons in the electric current flow using these 'human atoms'

The Australian Research Council Centre of Excellence in Future Low-Energy Electronics Technologies (FLEET) was recently established to develop new-generation, ultra-low energy electronics. Associate Professor Meera Parish, Dr Carlos Kuhn, and Rebecca Orrell-Trigg, a theoretical physicist, experimental physicist, and chemist respectively, described their work and vision for the future of electronics.

Dr Kuhn, a Postdoctoral Research Fellow at Swinburne University of Technology, explained how transistors work. Transistors are semiconductor devices that amplify or switch electronic signals (electric currents). A computer chip contains hundreds of millions, or even billions of transistors, each of which can be switched individually to one of two states: 0 or 1. There are millions and millions of binary calculations going on within such devices each second as the zeroes and ones are flipped, added, multiplied and divided at incredible speeds, all part of an integrated circuit.

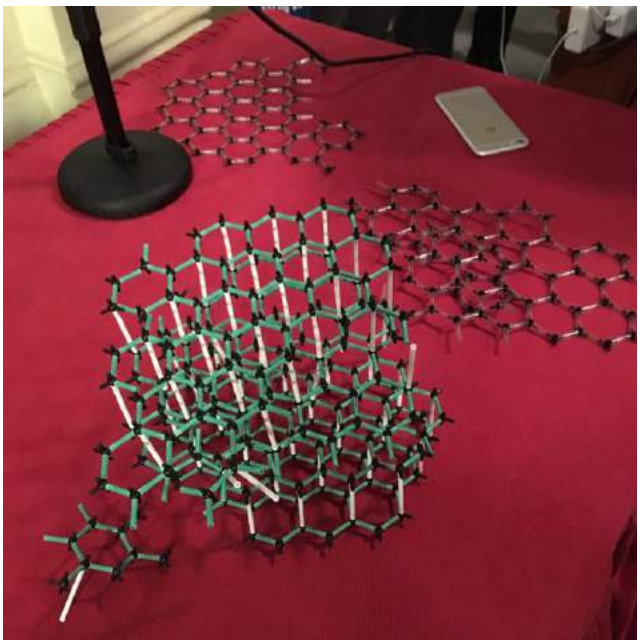
The biggest concern for Ms Orrell-Trigg with the many millions of transistors that form the basis of ICT, is the 'energy crunch'. She is a PhD student at the University of New South Wales and RMIT studying material science, developing new materials for future more-efficient computer chips. While we're reaching the physical limit of how small transistors can get, the most-important limiting factor to our computing power is not their size, but their energy usage.

A large amount of energy in transistors is used to perform calculations, but most of the energy is lost as heat (as people who have worked with a laptop on their legs can attest to). This energy is wasted due to the resistance that the electric current inside transistors meets as it flows irregularly through the material and scatters off impurities (it doesn't travel in a predictable line).

In fact, the amount of heat released within integrated circuits is such that not all transistors can be working at any given moment - most are cooling down. Otherwise the entire system would overheat. It is this wasted energy that researchers are hoping to avoid as they develop new ways of advancing computing power.

One solution is to design computer chips composed of different materials. For fifty years, silicon has been the common material used in chips, as it is abundant cheap, and easy to electronically 'fine tune'. FLEET researchers, however, are moving beyond these silicon-based chips to find more efficient materials. Graphene, a 2D form of carbon, has great potential as it is a thin sheet of carbon atoms in which electricity can flow without resistance and energy loss. A/Prof Parish is therefore exploring the conductive properties of these so-called 'atomically-thin' materials at Monash University.

As well as atomically-thin materials, A/Prof Parish investigates the relatively new physics field of *topology*. Topology is the mathematical study of shape, or of properties that are preserved through deforming an object: through twisting and stretching, but not tearing. For example, a coffee mug made of dough will still be topologically the same shape if it's moulded into a donut shape (the handle becomes the hole while the rest of the mug becomes the donut itself).



From 3D to 2D, the electrical properties of carbon significantly change when atomically thin.

Topological mathematics is also used to describe an entirely new class of materials. Topological materials fall 'outside' of the usual classifications, in which materials either conduct electricity (*conductors*) or do not

(*insulators)*. Topological materials insulate on their insides, but conduct electricity almost without resistance along their edges, without the scattering that causes heat loss in other materials. Imagine chocolate covered in aluminium foil: while electricity can't travel through the centre of the chocolate, it can travel along the foil edges.

All three scientists are working to take advantage of these new materials and gain insights to develop the next generation of low-energy electronics devices.

The remarkable advances in silicon-based CMOS computing technology (tracked by Moore's Law since the 1960s) have come via due incremental, significant advances in technology. The three FLEET scientists are hoping to find an entirely new, 'disruptive' generation of technology, which would allow computing to continue to grow. As our demand and reliance on electronic devices continues, the only way to have sustainable growth – both in the environment and in economy – is to go low-energy.

Fashionable Science

by **Catriona Nguyen-Robertson MRSV**

This article follows a panel presentation to the Royal Society of Victoria on 28th February, 2019 from Dr Leah Heiss (RMIT), Dr Nolene Byrne (Deakin), Dr Rajesh Ramanathan (RMIT) and Dr Lyndon Arnold (CSIRO/RMIT).

Leah Heiss, Design Futures, RMIT

Dr Leah Heiss has 'a strong commitment to making wearable technologies look better', so that the medical devices and technologies of the future will neither be 'ugly nor beige'. When developing biomedical devices, bioengineers, researchers and medicos often neglect to think about the aesthetics and occasionally practicality in favour of function. But beauty in healthcare (e.g. fashionable wearables and well-designed hospitals) can make it more desirable, and more likely that patients will adhere to treatments. Leah's work is highly interdisciplinary, working with experts from nanotechnology, engineering and health services through to manufacturing.

Leah's designs are based on natural forms, such as minerals. This was her display at *Humans 2.0* during National Science Week in 2018.

The Diabetes Jewellery project was developed in collaboration with Nanotechnology Victoria in 2007. The technology allows for pain-free delivery of insulin to the body using nanoneedles that inject insulin through the skin, therefore replacing syringes. Originally attached to a large apparatus, these nanoneedles have been compacted into contemporary jewellery, including rings and necklaces. Leah also brought engineers and weavers together to produce the Smart Heart necklace, a wearable cardiac monitor with the capacity to collect, store and remotely transmit cardiac data to medical professionals for analysis. The neckpiece aims to replace bulky cardiac monitors with something that is more easily worn.

Dr Leah Heiss' Smart Heart Necklace

Leah received the 2018 Good Design Award and CSIRO Design Innovation Award for her

Facett hearing aid. She spent time with hearing aid users learn about their experiences, and realised that an ongoing frustration, especially for those with arthritis or vision impairment, is replacing tiny batteries in hearing aids. Facett uses a magnetic connector to recharge, bypassing the need to handle finicky batteries, and its sleek design aims to shift stigma of hearing aids being used for a 'disability to desirability'.

Rajesh Ramanathan, School of Science, RMIT

How convenient would it be to clean clothes without the hassle of washing them? Dr Rajesh Ramanathan has the solution by incorporating nanotechnology into textiles.

Nanoparticles can impart interesting properties and functionalities into materials. One property that Rajesh uses to his advantage is *photoactivity*, where light is a trigger for a reaction. To design any wearable material with this technology, he had to overcome the challenge of making it retaining its properties with repeated washes – a feat that took 3-4 years.

His original intent was to translate this technology into wound management, to both encourage the healing process and prevent infection. Rajesh developed a nanomaterial that provides electric stimulation when exposed to infrared light. Electric stimulation has been long known to accelerate wound healing, and was even used by the ancient Greeks and Romans in the form of 'electric eels' in footbaths to treat pain and increase blood circulation. Additionally, Rajesh's nanomaterial fabric contains silver, which has antibacterial activity, therefore killing any bacteria that may enter the wound.

Two serendipitous by-products of his invention were wearable sensors and self-cleaning materials. By incorporating semi-conductors onto fabric, it could store and transmit information, thereby able to measure and sense various parameters (e.g. that can measure oxygen levels in a room). Lined with copper and silver, the nanomaterial could break down molecules in an organic stain (i.e. from food) when activated by light. Imagine not having any hassle of cleaning after accidentally spilling wine down your front! Originally designed for one purpose, Rajesh has killed three birds with one stone in unexpected discoveries along the way.

N**olene Byrne, Deakin Institute for Frontier Materials**

Circular fashion is the next big thing. The global textile industry is the second largest polluter of clean water and nearly five per cent of all landfill space is consumed by textile waste. Cotton consumes the highest amount of harmful pesticides and copious quantities of water, and similarly, textile-manufacturing units release hazardous waste into nearby land.

Dr Nolene Byrne has developed a way to recycle textile waste into useable products. She collects cotton-based textile waste and breaks it down into the fibres it was originally composed of. She mills solid coloured clothing into coloured powders, which can then be used to dye new clothes, eliminating all the energy and water involved in the normal dying process. This takes her 'back to kindergarten' as she mixes different coloured clothing waste to create different coloured fibres and dyes.

Dr Nolene Byrne and Beini Zeng make jeans green. (Photo: Deakin IFM)

Nolene's biggest campaign is turning jeans green. As denim is made of cotton, a natural polymer comprised of cellulose, it can be broken down back into cellulose. She and her PhD student, Beini Zeng, dissolve denim and manipulate the remains into an *aerogel* of cellulose material. Aerogels are a class of advanced materials with very low density and are porous with many nanoscale tunnels, making it an excellent material for water filtration, absorption, and bioscaffolding. The aerogel produced from this process creates a structure almost identical to cartilage, and now she can shape it by manipulating the size and distribution of tunnels to make it an ideal shape for synthetic cartilage to replace damage knee cartilage in arthritic patients. Ultimately, Nolene wants to eliminate waste and environmental pollution in the textile industry by making fashion circular.

Panel discussion: Lyndon Arnold, Rajesh Ramanathan, Leah Heiss, Nolene Byrne

Lyndon Arnold, Centre for Advanced Materials and Performance Textiles, RMIT

'Fashionable science is not just about catwalks'.

Lyndon Arnold belongs to a protection racket, designing clothing that keeps people safe. He tests various fabrics and materials for their strength, practicality, and susceptibility to damage so that he can constantly improve the safety of clothing.

Firefighters need protection from fire, radiation, and sparks, but most outer materials that provide sufficient protection are UV-degradable (exposure to the sun for a few months reduced their strength to 20%) – not ideal for those who have to fight fires in the Australian summer. Other factors to consider in the design are heat generated while working, visibility through smoke, and heat conductivity of zips. Lyndon had to design firefighter uniforms that could best suit the extreme temperatures and dangers that those wearing them face. He also designed colourful, reflecting safety vests for railway workers to be seen by train drivers.

On the other hand, for soldiers, to be seen is to be killed. Lyndon has thoroughly researched the design of ballistic vests, and impenetrable body armour. He and his team have developed fabrics that improve resistance to stabs and punctures. They also developed fabric for cycling gear that minimise abrasion upon impact when a cyclist falls to reduce injury. The material also aims to keep wounds as clean as possible if tearing does occur to prevent infection. By testing various materials and incorporating textile engineering, he is able to make protective clothing for the survival of others.

Dr Leah Heiss, Dr Renee Beale (MC), Dr Rajesh Ramanathan, Mrs Nicola Williams (Chair), Dr Nolene Byrne, Dr Lyndon Arnold, Dr Kevin Orrman-Rossiter (vote of thanks)

Call for Applications:

Young Scientist Research Prizes 2019

The Royal Society of Victoria has established four prestigious competitive prizes open to post-graduate, doctoral students in all areas of the Biomedical & Health Sciences, Biological Sciences (Non-human), Earth Sciences and Physical Sciences.

2017 finalists with RSV officers

The Biological Sciences (Non-human) prize and Earth Sciences Prize are also supported by the legacy of our previous Presidents, Edmund D Gill and Neil Archbold respectively.

The category of **Biomedical and Health Sciences** includes the fields of Endocrinology, Epidemiology, Genetics, Human Physiology, Human Anatomy, Immunology, Medical Parasitology, Microbiology, Neurology, Nuclear Medicine, Pathology, Pharmacology, Radiology and related human sciences apart from clinical trials.

The category of **Biological Sciences (Non-human)** includes the fields of Agriculture, Biochemistry, Botany, Cell Biology, Ecology, Evolutionary Biology, Forestry, Zoology, and related non-human science.

The category of **Earth Sciences** includes the fields of Geochemistry, Geochronology, Geology, Geophysics, Planetary Physics, Meteorology, Oceanography, Palaeontology, Physical Geography and related sciences.

The category of **Physical Sciences** includes the fields of Astronomy, Astrophysics, Chemistry, Mathematics, Physics, all branches of Engineering and related sciences.

Eligibility:

Application is open to candidates in the fourth* year of their doctoral candidature in Universities in the State of Victoria at the time of application, and who are members of the Royal Society of Victoria. Candidates who have submitted their thesis are ineligible.

In order to promote the interests of young people starting their careers, we are limiting applications to doctoral candidates under 40 years of age.

Applicants who are not already members are required to join the Society (see below). RSV student membership for eligible applicants in 2019 is free.

*For institutions with three-year doctoral programs, please read this as “final year.” Technically, you must be close to submitting your final research thesis for assessment in the year of award application.

Applications:

Applications opened for the 2019 round on 1 March and will close at 5.00pm on 31 May.

Candidates should nominate themselves.

The application for a prize should consist of:

- **An application form** (incorporating your extended abstract) to be submitted electronically, then printed (from your confirmation email), co-signed by your Supervisor or Head of Department (to ratify your contribution to your doctoral research, particularly if it is a team research project) and submitted along with your RSV Membership Form (if required).
- **An extended abstract** presenting a succinct summary of your research work. This is incorporated in the body of the application form to guide structure and length, and includes a title, rationale for the study, aims, methods, results, conclusions and significance, indicating why your research is important and of scientific interest.

Submission:

Submission of the prize application form and abstract should be co-signed with your supervisor and received as a single file via email marked for the attention of the Chief Executive Officer at rsv@rsv.org.au.

Conditions:

If you are not already a member of the Royal Society of Victoria, please submit as a ***separate*** document a completed Royal Society of Victoria Membership Application form for 2019 Prize applicants. Student membership for all eligible Prize applicants will be free of charge for the remainder of 2019.

The Royal Society of Victoria may re-classify the field of an application if it fits best in a field other than the one nominated by the applicant.

The Society reserves the right not to consider applications that do not comply with the above requirements and not to make an award if there is no suitable candidate.

Judging:

On the basis of the written abstracts, the judges will select a short list of two candidates in each of the four fields of Biomedical and Health, Biological (Non-human), Earth Sciences and Physical Sciences.

The award is based on demonstration of the applicant's excellence in scientific research, ability to communicate scientific information clearly and succinctly to an audience of scientists and members of the general public on their particular research field and to answer questions from the audience.

Each of the short-listed candidates will be required to give a 15 minute oral presentation (10 minutes presentation, 5 minutes discussion) before a general audience of scientists and members at the Society on **Thursday, 15th August, 2019** commencing from 6:30 p.m. Finalists who are unable to present cannot be considered for an award. The order of speaking is decided by ballot on the night. The presentations are open to fellow students, friends and families as well as Members of the Society.

The winners will be judged and announced on the night, when the prize and a certificate will be presented by the Society's President.

The Awards:

The successful candidates will each receive a certificate and a prize of $1000. Winners will also receive free student membership of the Royal Society of Victoria for a period of two years and the opportunity to participate in the Society's programs and access our professional networks for mentoring and collaboration as desired. The runners-up each receive a certificate and a cash prize of $500 plus free student membership of the Royal Society of Victoria for a period of two years.

Enquiries: Chief Executive Officer, The Royal Society of Victoria, 8 La Trobe Street, Melbourne 3000 Telephone: (03) 9663 5259 or email rsv@rsv.org.au . All online application and membership forms are available from https://rsv.org.au/awards-and-prizes/young-scientist-research-prizes/

Call for Nominations:

The RSV Medal for Excellence in Scientific Research 2019

In its Centenary year (1959) the Royal Society of Victoria instituted a Medal for Excellence in Scientific Research. The Award consists of a Silver Medal, which is awarded annually for scientific research in one of four categories that rotate from year to year.

2018 Joint Medallists Professor Anthony Burkitt and Professor Jamie Rossjohn with the Society's Patron, Her Excellency The Hon Linda Dessau AC, Governor of Victoria

Now in its sixtieth year, we are delighted to invite nominations for the **Royal Society of Victoria Medal for Excellence in Scientific Research 2019** in **Category III: Earth Sciences.** This category includes research in the disciplines of Geology, Geochemistry, Geochronology, Geophysics, Planetary Physics, Meteorology, Oceanography, Physical Geography, Palaeontology and related 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.

Nomination:

- Nominations open on **31 March, 2019** and close at **5pm** on **31 July, 2019.**
- Candidates cannot nominate themselves.
- Scientific Societies, Academies, Universities, Research Institutes, CSIRO, and Members of the Royal Society of Victoria are invited to make nominations.
- The nomination statement should demonstrate the candidate's:

1. Exemplary publication track record during the ten year period from 1st January 2009 to 31st December 2018. The track record will be judged on papers published and/or accepted for publication in refereed international journals. Work outside the ten year period will not be considered.

Career record relative to opportunity will be considered by the assessors. Nominators should indicate whether the nominee is an early career researcher, has had career interruptions, or has had extended periods of part-time employment. For multi-authored publications, the contribution of the applicant should be indicated.

2. Consistent excellence in innovation or ground-breaking research and patents, incorporating novel scientific techniques and methods – described in plain language.

3. Exemplary leadership in science incorporating evidence of: a major contribution to the public promotion of science, advocacy for science, partnership building, collaborations, role model and influence across the scientific community.

Submission:

The submission should consist of:

The nomination statement, signed by the nominator, covering points 1 to 3 above. This must be in Times New Roman, 11 point, and no more than three A4 pages please.

A brief (no more than five A4 pages) Curriculum Vitae of the candidate. A list of publications, attached in supplement, should be constrained to the ten year period from **1st January 2009 to 31st December 2018.**

The nomination submission should in the form of a single PDF file sent via email to the Chief Executive Officer at **rsv@rsv.org.au**

Conditions:

- The Royal Society of Victoria reserves the right to seek independent referees in considering the nominations received, and not to consider nominations that do not comply with the nomination format or do not address the award criteria.
- If no candidate of sufficient merit is nominated, no award need be made in a particular year.
- No posthumous award will be made.

The Award:

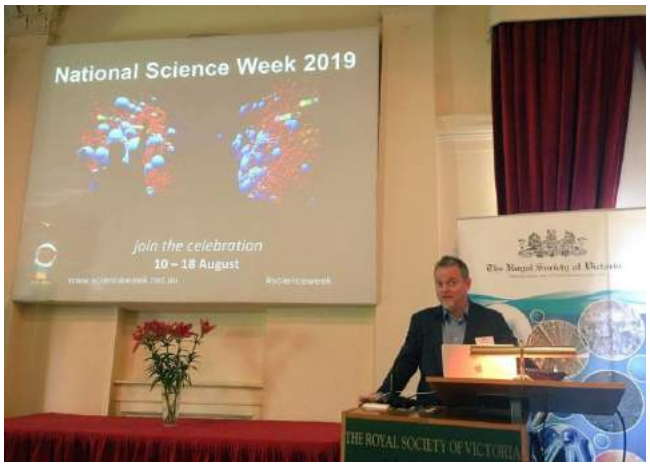
The successful candidate will receive an engraved silver medal which is presented by the Society's patron, Her Excellency the Governor of Victoria, The Hon Linda Dessau AM.

The medallist will be required to present a lecture to the Society Members and guests on the evening of Thursday, 12th December 2019 at which the Medal will be presented.

Enquiries: CEO, The Royal Society of Victoria, 8 La Trobe Street, Melbourne 3000 Telephone: (03) 9663 5259

national science week

National Science Week, Victoria 2019: join the celebration



Mike Flattley: Science is for Everyone

Preparations for National Science Week (10 – 18 August) have officially kicked off in Victoria! Everyone interested in being a part of the state-wide celebrations were invited to the Royal Society of Victoria (RSV) on Monday, 18 March for an information and networking session.

RSV CEO, **Mike Flattley** opened the session with an acknowledgement of the traditional owners of the land, the first scientists, and the first artists of Australia. Science Week is about breaking down barriers between scientists and the community. As 'art isn't just for artists', and 'music isn't just for musicians'; similarly, 'science is for everyone'.

Victoria's Lead Scientist, **Dr Amanda Caples**, bade a warm *wominjeka* to all – a Woiwurrung word which she emphasised not only means "welcome" but also "we come with a purpose". She has always been bewildered at how art and science are seen as 'opposing forces', when they can come together to inspire. Multiple STEM organisations, libraries, schools, and communities work together during science week to inspire young people, and all audiences to get behind science.

A beautiful blend of science and art was demonstrated by **Sam Colcheedas,** who composed a piano piece in dedication of the Mars rover Opportunity. Opportunity's remarkable 15 years of roaming the planet were represented by both a dissonant, haunting melody, and a hopeful, flowing tune, and Sam captured its last moments, when it sent the message 'my battery is low, and it's getting dark'.

Science Week is about encouraging everyone to 'have a go at science, and empowering young people and the community to achieve' – Dr Amanda Caples.

Dr Renee Beale: working towards covering the state map with one big, red dot.

Last year, there were 435 registered events for Science Week in Victoria, 109 more than the year before. Every year it gets bigger and bigger! This is in part due to the efforts of the RSV's **Dr Renee Beale**, Victorian Science Week Lead. This year she is aiming for over 500 events.

In 2019, Victoria will be hosting Dr Darlene Lim as an international guest from NASA. Dr Lim has explored extreme environments and habitats on earth to gain insights as to how we can prepare human explorers for the environments of other planets. In a week, she will have seen much of Victoria as she travels around to speak to different audiences.

Exciting events to look forward to this year are the **Science at the Extremes** launch event at **Melbourne Museum** (Friday, 9th August), featuring Dr Lim and other guests who study extreme environments and

Extrasensory, a major event at **Parliament House** (Saturday, 10th August) to explore different senses and even senses you may not have imagined before.

Paul Boys, Director of the Gippsland Tech School, spoke about series of events they will host across Victoria's southeast with hands-on activities and space exploration. Dermot Henry and Jen Brook listed events held by Museums Victoria, home to 17 million specimens and a great record of our natural world. Melbourne Museum and ScienceWorks will play host to many programs that invite everyone to take part in exploring our Universe. Tilly Boleyn, Science Gallery Melbourne is curating the exhibition *Disposable*, which will include a Trash Robot to clean up the Yarra River, soaps made from oils and fats taken from sewerage, and worms that can break down your polystyrene waste.

There are multiple ways for you to be involved in Science Week; whether it's helping with the running of events, attending events, or spreading the word. The Victorian National Science Week Coordinating Committee invite you to apply for seed funding to run a public event, activity or program during National Science Week. There are funds to support community events and library initiatives, and the Australian Science Teachers Association is also providing grants to schools and *Destination Moon* resources to celebrate the 50th anniversary since the Moon Landing.

National Science Week is a time to get excited about science, try something new and learn about topics you've never thought about.

Science Week Grants

A range of grants are available to individuals and organisations wishing to present events and activities for National Science Week. These have been announced via social media, websites and the Society's earlier newsletters.

Victorian 'Seed' Grants

Administered by the **Royal Society of Victoria**, applications are invited online at https://inspiringvictoria.org.au/programs/national-science-week-victoria/grants/, and include:

Victorian Seed Grants – Community

- Open for application **now**, until **10 April 2019.**
- These grants are designed to support individuals and organisations who wish to run public science events and activities within Victoria during National Science Week.
- Applicants may apply for a minimum of $500 and a maximum of $2000 each (GST free), allowing event-holders to kick start their events and gain further support from host or partner organisations. Applications are assessed by the Victorian Coordinating Committee.
- Please note: these grants are for public engagement and not available for school events in Science Week (for school activities please refer to the National Science Week School Grants below).

Victorian Seed Grants – Libraries

- Open for application **now**, until **10 April 2019.**
- These grants are designed to support libraries who wish to run public science events and activities within Victoria during National Science Week.
- Grants are $500 each. Public Library Services may apply for multiple grants, provided separate grant applications are submitted, and the applications are for events occurring at different locations.
- Please note: this grant scheme is for public libraries only. Schools wishing to apply for National Science Week funding may apply to the National Science Week School grant scheme. Organisations or individuals (other than public libraries and library staff) should apply to the Victorian Seed Grant – Community scheme even if these organisations or individuals plan to use a library as an event venue.

National Science Week School Grants

The 2019 grant round is now open for application until **5 April 2019.**

This grant scheme, managed by the **Australian Science Teachers Association**, is specifically for schools wishing to gain support to run an event for students during National Science Week.

Visit the National Science Week website at https://www.scienceweek.net.au/schools/ for information and updates regarding these grants, and for more details and resources about the schools' program.

National Science Week Grants

The 2019 grant round has closed for this scheme.

This grant round typically opens in early September and closes in October, offering large grants for events held in the following year's Science Week.

Managed by the National office, these grants of up to $20,000 per application are available for individuals, community groups, universities, research institutions and other organisations to hold events for the public to participate in science across the country.

Visit the National Science Week website at https://www.scienceweek.net.au/ for announcements regarding these grants.

Partnership Network Grants

The Inspiring Australia Victoria (IAV) program seeks to increase year-round participation in science and develop new science engagement opportunities. As part of this, the IAV program now offers small grants ($500–$2000) to support regionally-based organisations to deliver community science engagement programs and events.

What activities are eligible?

Grants are designed to support organisations seeking to run public science events and activities within Victoria. We particularly encourage applications for grants for suburban, regional and rural events, and events involving collaboration between two or more organisations from different sectors or disciplines.

Eligible activities include Lifelong Learning, Citizen Science, and Kids Science Clubs. Learn more about suggestions for these type of activities by reading our **Inspiring Australia Victoria Grants brochure**, available online from https://inspiringvictoria.org.au/grants/partnership-network-grants/ .

Who can apply?

In 2019 the Partnership Network Grants will be available to members of Public Libraries Victoria and the 10 Victorian Tech Schools, who will be lead agencies for their Local Government Areas (LGAs). Other organisations, groups or individuals interested in applying for a grant should contact their local PLV library or Tech School to discuss auspicing, support, and/or collaboration.

When to apply?

Round 1 will open on 1 March and close 30 April.

Round 2 will open on 13 May and close 28 June.

Round 3 will open on 15 July and close 30 September.

To submit, use the online application form **at** https://inspiringvictoria.org.au/grants/partnership-network-grants/partnership-network-grant-application-form/

How are grants awarded?

Grant applications are reviewed as they are received. Grants will be awarded by no less than three members of the Royal Society of Victoria's Outreach and Partnerships Committee within each round until the allocated funds are expended.

Science and Laughter: A Teaser to National Science Week

While you're waiting for National Science Week to roll around, multiple scientist-comedians are presenting shows to whet your appetite as part of the **Melbourne International Comedy Festival.** Four performers are sharing their science stories, exploring the brain, electricity, your subconscious, and love. Perhaps you could find out why you subconsciously love science!

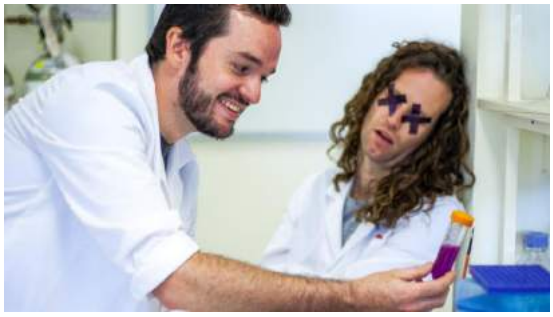
You Chose Poorly

Atlanta Colley and Ben McKenzie are presenting *You Chose Poorly*, diving into why we make the decisions we make. Every day, we make so many choices that impact our lives in different ways: in our outfit for the day, in relations, in finance, and what we eat. Some choices can be worse than others – and you may even regret a few. Atlanta and Ben are diving into the psyche and subconscious to find out why it is that we can make bad decisions. They hope that your decision to come to their show will not be among the bad ones!

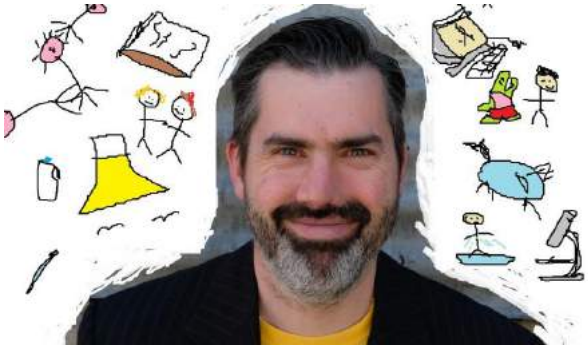
Details and tickets: https://www.comedyfestival.com.au/2019/shows/you-chose-poorly

Why You're Not Dead Yet

Last year's MICF and National Science Week introduced David Farmer to the (Melbourne) stage as a neuroscientist and comedian. Based at the Florey Institute of Neuroscience and Mental Health, he studies the subconscious functions of the brain stem including regulation of your breathing, heart rate, and blood pressure – the things that keep you alive. Together with comedian Jackson Voorhaar, they will explore *Why You're Not Dead Yet.*



Details and tickets: https://www.comedyfestival.com.au/index.php/2019/shows/why-you-re-not-dead-yet



Love, Sweat and Science

Things get personal when Luke Morris dives into *Love, Sweat and Science.* Armed with pictures drawn on Microsoft Paint and the Gray's Anatomy textbook, Luke will tell a true story on the science of human interactions. Based on the TV show, If You Are The One, he will delve into the question of whether love is real, is it possible to stop sweating, and whether over-thinking will answer all our questions.

Details and tickets: https://www.comedyfestival.com.au/2019/shows/the-science-of-love-and-sweating

Tesla: Death Rays & Elephants

Our world would not be the same without Nikola Tesla, who designed our modern electricity supply system. Sean M Elliot is taking audiences on a journey through the electric and eccentric genius of Tesla and the invention of high voltage electricity as we know it. Complete with science demonstrations, stories, and a Tesla Coil that spits out electric sparks, he is looking at all things *Tesla: Death Rays & Elephants*.

Details and tickets: https://www.comedyfestival.com.au/index.php/2019/shows/nikola

Notice of Annual General Meeting of the Royal Society of Victoria

Thursday, 9th May at 5:00pm

Full RSV members (ie. with voting rights) are asked to register their intention to attend the 2018 AGM (not an error – held in 2019!), noting **a quorum of 50 will be required.** If you cannot attend, please nominate your proxy on the form provided below (and online at https://rsv.org.au/proxy-form-for-voting-at-2018-rsv-agm/).

Once the AGM business has concluded, **Professor Sandra Rees** will be inducted as a Fellow of the Royal Society of Victoria. There will be a **members' cocktail function** from 6pm, after which **Professor Murat Yücel** will present to the Society on the subject of **Gamble, Drink, Consume, Repeat: Why we need BrainPark** from 7pm. Please see the event listing earlier in this newsletter for details of a separate registration for non-members and our student members to attend the lecture. A voting members' attendance at the AGM automatically reserves you a place at the cocktail function and a seat at the lecture, there's no need to book twice!

Voting RSV members only at the AGM please. Please note student members are ineligible to vote in RSV Council elections or at the AGM, but all members are welcome to join us for the function at 6pm and Professor Yücel's lecture from 7pm – we encourage our student members to register to attend the lecture so we can hold your place.

Meeting papers will be distributed in April.

Eventbrite

Places limited – our theatre has limited capacity. *Cocktail function to follow from 6:00pm, lecture from 7:00pm.* **Register online** now at https://rsv.org.au/events/2018-agm/, call or email the RSV office to secure your place: 9663 5259, rsv@rsv.org.au.

PROXY Form for Voting at the Annual General Meeting of THE ROYAL SOCIETY OF VICTORIA (INC)

In accordance with the Rules of the Society, financial Members of the Royal Society of Victoria Inc. may vote in person or by proxy. Rule 21 (1) requires notice of the appointment of a proxy, who is a member of the Society, to be given or sent to the Honorary Secretary at the Society's Office no later than **5.00 pm on Wednesday 8th May 2019**, the last working day before the meeting, **which will be held at 5:00 pm on Thursday 9th May 2019** in the Society's Ellery Theatre.

To assist Members in lodging notice of the appointment of a proxy, this form is provided.

I……

(Block letters please)

being a Member of The Royal Society of Victoria Inc. appoint as my proxy:

☐ The Chairman of the Meeting*

☐ ……*

(Name of the Voting Member who is to be proxy, BLOCK LETTERS please)

***Please tick one box.**

More items overleaf.

My instructions are to vote for / against (please circle one for each motion):

If direction to vote 'For' or 'Against' is not provided, the Proxy is considered undirected and so may be used at the discretion of the nominated Proxy holder.

Ordinary Business:

Moved: D. Zerman Seconded: P. Baines
That in accordance with Rule 11 (4) (a) the Minutes of the 2017 Annual General Meeting held 26th April 2018 as presented to Council be confirmed.

For / Against / Proxy's Discretion (circle one)

Moved: D. Zerman Seconded: P. Baines
That in accordance with Rule 11 (4) (a) the Minutes of the Special General Meeting held 21st June 2018 as presented to Council be confirmed.

For / Against / Proxy's Discretion (circle one)

Moved: D. Zerman Seconded: P. Baines
That the 2018 Annual Report (including the President's Report) of the Royal Society of Victoria be received in accordance with Rule 11 (4) (b) and (d).

For / Against / Proxy's Discretion (circle one)

Moved: A. Davison Seconded: P. Baines
That the 2018 Financial Report and Auditor's statement of the Royal Society of Victoria be received in accordance with Rule 11 (4) (b) and (d).

For / Against / Proxy's Discretion (circle one)

Moved: A. Davison Seconded: P. Baines
That Pitcher Partners Advisors Pty Ltd be invited to accept the position of Auditor of the Royal Society of Victoria for 2019 in accordance with Rule 11 (c).

For / Against / Proxy's Discretion (circle one)

Special Business:

Moved: R. Stramandinoli Seconded: P. Baines

That proposed amendments to the Society's governing Rules as circulated in April 2019 be received and confirmed in accordance with Rule 3.

For / Against / Proxy's Discretion (circle one)

Moved: R. Stramandinoli Seconded: P. Baines

That amendments to the Society's procedural By-Laws as presented to Council be received and noted in accordance with Rule 40 (1).

For / Against / Proxy's Discretion (circle one)

Signature …… Date …….

Please detach and return to:

The Honorary Secretary
The Royal Society of Victoria
8 La Trobe Street
Melbourne VIC 3000

To reach the Royal Society of Victoria office not later than 5.00pm on Wednesday 8th May, 2019

Office Use Only:
Date Received:
Member Financial: Y / N
Voting Member: Y / N