



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...

6th June: *Road Safety Vision Zero: the Science and the Technology*

*Featuring **Dr Johan Strandroth** with panellists **Mr Kenn Beer, Dr Marilyn Johnson, Mr David Shelton, Dr Max Lay** and **Ms Samantha Cockfield***

7th June: *Communicating Science in a Post-Normal World*

*With **Professor Mike S. Schäfer**, featuring panellists **Professor David Karoly & Dr Linden Ashcroft***

13th June: *Edible Nature Strips & Subsidised Worm Farms: Solutions for People & Planet*

*With **Mrs Liza Barbour MPH APD***

27th June: *From Monsoons to
Desert: 50 Million Years of
Australian Climate History*

*The 2019 Howitt Lecture
(presented with the
Geological Society of
Australia, Victoria
Division)*

*With **Associate Professor
Stephen Gallagher***

Advance Notice

25th July: *Social Work: Collaborative Human-Robot
Interaction*

*With **Professor Elizabeth A. Croft***

June 2019 Newsletter

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

Road Safety Vision Zero: The Science and the Technology

Thursday, 6th June 2019 from 3:30 to 7:00pm



Guest Speaker:
Dr Johan Strandroth

**Safe System Lead, Safe System Road Infrastructure Program, VicRoads & TAC
Project Director, Road Safety Strategy,
Department of Transport**

In 2017, two Prince Michael International Road Safety Awards proudly went to Australia.

One was awarded to the [Australasian Road Safety College](#) (ACRS) for Road Safety Advocacy, while the other was jointly awarded to VicRoads and [Safe System Solutions Pty Ltd](#) for their joint programme, "Making Roads Motorcycle-Friendly".

To celebrate, we've created an opportunity to listen and participate in a Q&A with guest speaker Dr Johan Strandroth, the overseer of the development of Victoria's next Road Safety Strategy. Johan will be joined by a panel of industry leaders in Science and Road Safety, containing valuable insights into the development of Safer Roads and the future Road Safety Strategy.

Meet and exchange ideas with others seeking to create better roads for our communities, gain valuable industry insights and improve your knowledge on current and future Road Safety Strategy. Ensure you attend, and be part of the change.



About the Guest Speaker



Dr Johan Strandroth is a civil engineer from Sweden with a Master and PhD in Machine and Vehicle Safety Systems. Before moving to Victoria, he worked as a senior road safety adviser and researcher with the Swedish Transport Administration. Methodologies developed in his research make up the foundation of the analytical framework and target management system for Sweden's road safety strategy. In Victoria, Johan has been the Safe System Lead in VicRoads and TAC's Safe System Road Infrastructure Program and holds the position of

Project Director at the Department of Transport, overseeing the development of Victoria's next Road Safety Strategy.

The Panel:



Facilitator: Mr Kenn Beer (Principal Engineer, Safe System Solutions Pty Ltd).

Panellists: Dr Marilyn Johnson (Senior Research Fellow, Monash University), **Mr David Shelton** (Principal Consultant, Safe System Solutions Pty Ltd), **Dr Max Lay** (Former Director, ConnectEast, VicRoads and Australian Road Research Board), **Ms Samantha Cockfield** (Senior Manager, Road Safety, Traffic Accident Commission).



\$50 registration. Afternoon tea, presentation, forum discussions and cocktail party included in the registration. **Register online** now at <https://rsv.org.au/events/road-safety-forum/>,

Communicating Science in a Post-Normal World

Friday, 7th June 2019 at 5:30pm



Speaker: Dr. Mike S. Schäfer
Professor of Science Communication, Department of Communications & Media Research
Director, Center for Higher Education and Science Studies
The University of Zurich

Communication and dialogue between science and society are important for both sides. Science informs individual and collective decisions, while social context and social needs guide the direction of scientific enquiry.

But the science communication ecosystem is changing: Science is growing, and fields like genome editing, artificial intelligence or climate science are turning into “post-normal science”, fields with rapid development that initiate public debates and raise ethical issues. At the same time, the communicators of science are changing, with science journalism in decline, strategic communication expanding and digital media empowering users to engage in science communication as well. As a result, public perceptions of science have shifted, with trust in science seemingly eroding, “alternative facts” gaining in importance, and populist movements finding traction.

Hear a keynote address from **Professor Mike Schäfer**, who will then join panellists **Professor David Karoly** and **Dr Linden Ashcroft** to explore this process, highlight the challenges and identify future directions for science communication.

About the speaker:



Dr. Mike S. Schäfer is Professor of Science Communication with the University of Zurich’s Department of Communications and Media Research. He is also Director of the University’s Center for Higher Education and Science Studies (CHESS) and of the AGORA commission at the Swiss National Science Foundation. His research focuses on science communication, online communication and public sphere theory, issues on which he has published widely.

The panellists:



Professor David Karoly: Leader, Earth Systems & Climate Change Hub, National Environmental Science Program, CSIRO

Dr Linden Ashcroft: Lecturer in Climate Science & Science Communication, School of Earth Science, The University of Melbourne

A part of the ‘Media Matters’ seminar series, funded by the Monash University School of Media, Film and Journalism.



Places limited, bookings essential! Register online now at <https://rsv.org.au/events/post-normal-scicomm/>, call or email the RSV office to secure your place: 9663 5259, rsv@rsv.org.au.

Edible Nature Strips & Subsidised Worm Farms: Solutions for People & Planet

Thursday, 13th June 2019 at 7:00pm



Speaker: Mrs Liza Barbour MPH APD
Lecturer, Department of Nutrition and Dietetics
Faculty of Medicine, Nursing and Health Sciences
Monash University

Our global population is expected to reach nearly 10

billion people in 2050, requiring our planet to produce more food. This is problematic on two levels; firstly, trends in climate change impacts pose great threats to the planet's capacity to produce more food into the future, and secondly, our current food system, predominantly industrialised, is accelerating the impact of climate change.

Our food system collectively contributes 19-29% of the world's greenhouse gas emissions, requires 20% of available freshwater, utilises 30% of all ice-free land, is the largest cause of deforestation and is responsible for 20% of global energy use. This complex dilemma is gaining global attention and demanding coordinated action – the United Nation's Sustainable Development Goals (SDGs) and, more recently, the EAT-Lancet Commission's work have set scientific targets for healthy diets and sustainable food production.

As individuals, our food choices contribute substantially to the pressure humankind is placing on our natural environment. To achieve the SDG targets, our population must change current dietary behaviours, which requires supportive policy at all levels of government.

Join Liza Barbour, who will describe what a 'healthy and sustainable diet' looks like, and explores the role that local governments can play in promoting changes in consumption here in Australia.

About the speaker:



Liza Barbour is an Accredited Practising Dietitian with over 15 years of work experience. Liza worked as a community dietitian in remote Western Australia and metropolitan Melbourne, a clinical dietitian at Alice Springs hospital, a public health dietitian at the Ministry of Health in the Kingdom of Tonga and as a nutrition programs manager at SecondBite, a non-profit food rescue organisation.

Liza co-convenes Australia's Right to Food Coalition and holds a Bachelor of Nutrition and Dietetics, a Master of Public Health and is currently completing her PhD studies whilst continuing to teach nutrition and dietetics students at Monash University. In their spare time, Liza and her husband make and sell pickles at farmers markets on the Mornington Peninsula with their 2 and 4 year old sales assistants. Over the past 15 years, Liza has developed a passion to contribute to a food system that is healthy, equitable and sustainable.

Eventbrite

Places limited, bookings essential! *Cocktail function from 6:00pm. Register online* now at <https://rsv.org.au/events/sustainable-diet/>, 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**.

The State of Victoria's Environment and the Environmental Profession

Wednesday, 26th June 2019 at 5:30pm



Dr Jack Pascoe, Conservation & Research Manager with the Conservation Ecology Centre, Cape Otway in the field with a conservation volunteer.
Photo: Doug Gimesy

A joint presentation with the [Environment Institute of Australia and New Zealand](#)



Environment Institute
of Australia and
New Zealand Inc.

Speakers:



Dr Scott Rawlings
Head of Science & Research
Victorian Commission for
Environmental Sustainability



Dr William Jackson
Chief Author, National State
of the Environment Report &
Former CEO Parks Vic



Mr Rob Gell
Director, Re-Think
Sustainability, Fellow of the
Royal Geographical Society &
the Environment Institute of
Australia, RSV Councillor



Ms Catherine Cavallo
Monash PhD graduand
(climate change ecology),
Science Communicator with
Remember the Wild

The Victorian State of the Environment Report has been released. What does this mean in the national context and for the future of sustainable development? What does it mean to environmental professionals, and how should the recommendations be framed so that they are tangible for multiple audiences?

Join the authors of the Victorian and National State of the Environment Reports, **Dr Scott Rawlings** and **Dr Bill Jackson**, to discuss the report along with **Rob Gell** providing insights to sustainability aspects, and **Cathy Cavallo** from talking us through communicating the report in the era of social media.



Environmental professionals who attend this event can record 1 point per hour of continuing professional development under the Certified Environmental Practitioner Scheme.



Places limited, bookings essential! RSV & EIANZ members: \$40, student members: \$20, non-members \$60. Online registrations at <http://tiny.cc/9mkk7y>. RSV members can register for the discounted ticket through contacting the EIANZ Central Office direct on (03) 8593 4140.

From Monsoons to Desert: 50 Million Years of Australian Climate History

Thursday, 27th June 2019 at 7:00pm



Speaker: Associate Professor Stephen Gallagher
Reader, School of Earth Sciences
The University of Melbourne

The 2019 Howitt Lecture - a joint presentation with the Geological Society of Australia (Victoria Division).

Geoscience in Australia can be uniquely challenging. The harsh, arid and intense monsoonal climate of our continent generally destroys much evidence of its past activity over millions of years on land.

Offshore, however, the story is different. The ocean floor receives and preserves huge quantities of dust and sediment derived from river outflow, recording dry and wetter conditions over millions of years, rather like many tree species' rings record the seasons.

The International Ocean Discovery Program (IODP) is the largest geoscience research program in the world. Over the last 50 years this program has used a variety of floating platforms and ships to drill cores from the sea bed beneath them in order to investigate Earth's history, leading to extraordinary discoveries about our paleoclimate and plate tectonics. In the last 5 years, the IODP vessel *RV Joides Resolution* carried out several expeditions in Australasian waters.

This talk will focus on a two-month expedition off northwest Australia led by Associate Professor Stephen Gallagher. This expedition cored over 6 kilometres of sediment beneath the sea bed to obtain a 50 million years record of Australian geological history, an archive that reveals a story of the waxing and waning of the Australian monsoon, Indonesian Throughflow and onset of continental aridity.

About the speaker:



Associate Professor Stephen Gallagher is a reader at the School of Earth Sciences the University of Melbourne. His research focusses the use of (micro)fossils and sediments to interpret ancient marine environments and to establish their age. In the last few years he has been on two International Ocean Discovery Program expeditions. He was an invited scientist on an expedition to the Japan Sea in 2013 and co-chief scientist on another expedition in 2015 off Northwest Australia. He has published over 100

publications including 80 journal papers, 12 book chapters and dozens of major reports.

He was Chair of the Geological Society of Australia Victoria division from 2006 to 2008.



Places limited, bookings essential! *Cocktail function from 6:00pm.* Register online now at <https://rsv.org.au/events/monsoons-desert/>, 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**.

Field Trip

Campfires & Science: Wild DNA at Kororoit Creek



Saturday, 28th June 2019 from 1:30 to 6:00pm

Kororoit Creek Neighbourhood House,
61A Selwyn Street, Albion, Victoria 3020

Join the next citizen science outing with Science for All, with an environmental DNA (eDNA) collection and sampling field trip.

We'll be hearing from Wurundjeri elders about how people used to live along the Kororoit Creek, while teaching participants how to detect the presence of local native animals using eDNA testing, how to test water for pollution, how to map an area using drones and giving everyone a chance to plant some trees. People of all ages are welcome.



A meal around a warm fire will be provided at 5pm! We formally wrap proceedings at 6pm, but stick around if you'd like to take a night walk to spot nocturnal wildlife and perhaps take a peek through some telescopes at the stars of our southern skies.

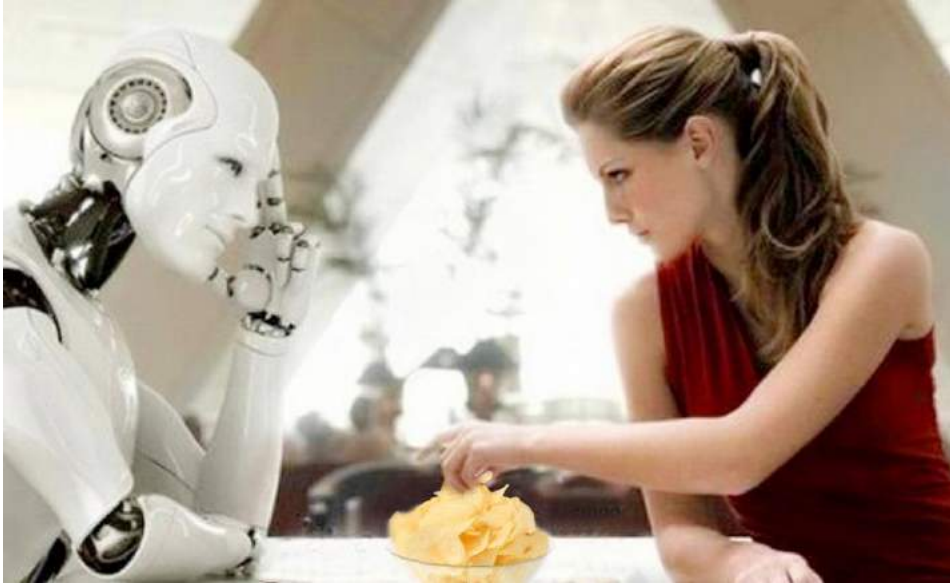
**Please note: a free vegan dinner is included. Unfortunately we cannot accommodate for any allergies; if you have any special requirements, please ensure you have catered for yourself.



A free event, please register to attend to assist organisers with planning and catering. Register online now at <https://rsv.org.au/events/wild-dna-kororoit/>, 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**.

Social Work: Collaborative Human-Robot Interaction

Thursday, 25th July 2019 at 7:00pm



Speaker: Professor Elizabeth A. Croft
Dean of Engineering, Monash University

A joint presentation with the Australian Academy of Technology & Engineering



Over the last decade, there has been a significant investment in humanoid and human-friendly robotics platforms. New safety standards have been developed, aimed at human-robot collaboration. In certain areas, robots have successfully entered our lives, vacuuming our floors and cutting our lawns. Yet in other areas, human-robot collaboration has not yet hit the mark, and social interaction has been identified as one of the ten “Science Robotics Grand Challenges”.

Join Professor Elizabeth Croft to discuss the development of human-robot interaction methods that will permit shared understanding of tasks, intentions, and responsibilities necessary for working and living together with robots.

About the speaker:



Professor Elizabeth A. Croft is the Dean of Engineering at Monash University and Professor in the Departments of Mechanical and Aerospace Engineering, and Electrical and Computer Systems Engineering. Her research in industrial robotics and human-robot interaction advances the design of intelligent controllers and interaction methods that underpin how people and autonomous collaborative systems can work together in a safe, predictable, and helpful manner.

She held the Natural Science and Engineering Research Council of Canada Chair for Women in Science and Engineering (BC/Yukon) from 2010-2015 and the Marshall Bauder Professorship in Engineering Economics, Business and Management Training from 2015-2017. Her recognitions include a Peter Wall Early Career Scholar award, an NSERC Accelerator award, WXN’s top 100 most powerful women in Canada and the RA McLachlan Award for Professional Engineering in the Province of British Columbia. She is a Fellow of Engineers Australia, the Canadian Academy of Engineers, Engineers Canada and the American Society of Mechanical Engineers.



Places limited, bookings essential! *Cocktail function from 6:00pm.* Register online now at <https://rsv.org.au/events/human-robot/>, 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:

Md Ataur **RAHMAN**, PhD Student, RMIT University

Professor Freya **MATHEWS**, Environmental Philosopher

Mr Yau Chung **LOW**, PhD Student, Murdoch Children's Research Institute

Dr Sapphire **MCMULLAN-FISHER**, Mycologist, Royal Botanical Gardens Victoria

Ms Montee **BONNEFIN**, Botany & Ecology Student, La Trobe University

Mr Probir Geoffrey **DUTT**, Composer, Head of Automation (Robotics & AI), IAG

Miss Melissa **REIDY**, Honours Student, La Trobe University

Dr Michael **JARVA**, Postdoctoral Researcher, The Walter & Eliza Hall Institute of Medical Research

Mr Simon **LEVERTON**, Retired Environmental Practitioner

Ms Avanthi Isaka **BADULLA LIYANAGE**, PhD Student, Monash University

Mr Bang Nguyen **TRAN**, PhD Student, The University of Melbourne

Ms Shruti **NIRANTAR**, PhD Student, RMIT University

Ms Amy **SHEPHERD**, PhD Student, The University of Melbourne

Mr Jozo **GRGIC**, PhD Student, Victoria University

Mr Po **PENG**, PhD Student, The University of Melbourne

Professor Murat **YÜCEL**, Clinical Neuropsychologist & Director of BrainPark, Monash University

Mr Rukshan Maliq **AZOR**, PhD Student, Monash University

Miss Palika **ABAYAKOON**, PhD Student, The University of Melbourne

Mr Francesco **CAMPAIOLI**, PhD Student, Monash University

Mr Khalid **ELSAAFIEN**, PhD Student, The University of Melbourne

Miss Harriet Rose **MANLEY**, PhD Student, Monash University

Miss Jacqueline **OGIER**, PhD Student, The University of Melbourne

Miss Pranali **DEORE**, PhD Student, Monash University

Miss Laura Kathryn **FERRICK**, PhD Student, The University of Melbourne

Miss Johanne Marie **MARTENS**, PhD Student, Deakin University

Mr Hakan **TARAKCI**, PhD Student, Monash University

Mr Anthony **BOGHDADI**, PhD Student, Monash University

Mr Ariel Mikhael **ZELEZNIKOW-JOHNSTON**, PhD Student, The University of Melbourne

Ms Amy **SEARLE**, PhD Student, Monash University

Ms Min **WANG**, PhD Student, La Trobe University

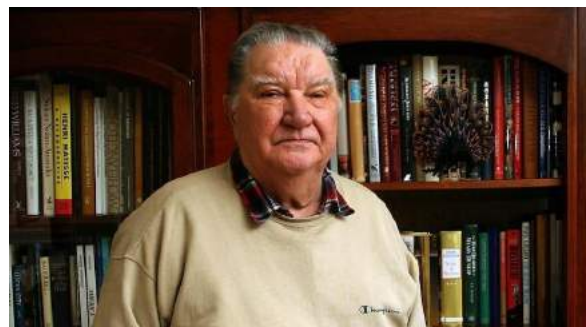
Mr Gluza **PAWEL**, PhD Student, The University of Melbourne

Miss Elvina **PARLINDUNGAN**, PhD Student, RMIT 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 25th July 2019. Recently elected members who have not yet signed the Society's membership book are warmly invited to attend the 13th June 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.**

Vale

**Sir Arvi Parbo AC FTSE FRSV
1926 -2019**



The Society's Council acknowledges with sadness the passing of Sir Arvi Parbo AC, one of the first Fellows inducted to the Royal Society of Victoria in 1997.

An Estonian refugee whose family fled from Soviet occupation in 1944, Sir Arvi migrated to Australia in 1949, subsequently attaining a

Bachelor of Engineering from the University of Adelaide and forging a remarkable career within the Australian mining industry as a surveyor, general manager, director, managing director and Chair. Western Mining, BHP and Alcoa were notable beneficiaries of his leadership, as were a raft of familiar international companies. He was appointed a Knight Bachelor for his service to industry in 1976.

A Fellow of the Australian Academy of Technology and Engineering, Sir Arvi was the Academy's President from 1995 to 1997.

He is remembered through the annual award of the Sir Arvi Parbo Medal to a final year engineering student at the University of Adelaide by Engineers Australia.

2019 Kids' Conference Melbourne Pre-Conference Workshop

Tuesday, 20th August
from 10:30AM to 2:00PM



The Kids' Conference is coming to Melbourne on **18th November** this year – an opportunity for primary and secondary students to present either individually or in groups on some aspect of their learning in History, Geography, English, Maths, Music or Science. It's a unique and engaging event where all presenters share their research projects through new and emerging digital platforms in a real conference environment.

The Kids' Conference is dedicated to student voice and student-led learning, working under the standard of "Kids Teaching Teachers." The initiative of Jo Clyne and Stephen Spain MRSV, the Conference federates the History Teachers' Association of Victoria, the Geography Teachers' Association of Victoria, the Royal Society of Victoria, Cultural Infusion

and the Museum of Australian Democracy, generously hosted by the Australian Catholic University.

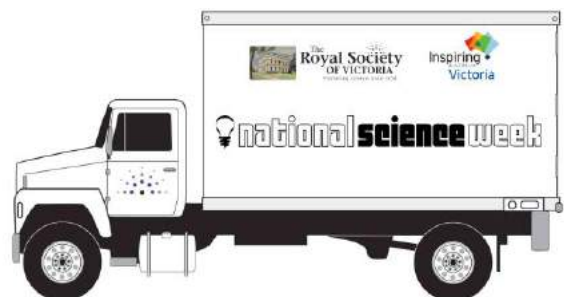
Conference registrations will open later in the year, but in the meantime the Society is delighted to be hosting the **Melbourne pre-conference workshop** to help presenters prepare with conference organisers and performance specialists from Cultural Infusion. Students are invited to bring along their big ideas for development and coaching in collaboration and presentation skills, and teachers will be provided with a professional development workshop in student-led learning approaches and facilitation skills.

Registrations are open and available from <https://rsv.org.au/events/kids-conference-workshop/>

Victorian Science Week Dispatch Centre

Call for Volunteers

2:00 – 4:00PM, Monday 17th June



Science Week is coming! We need your help to get materials out to event holders across Victoria to add some sparkle to their efforts in August. We've set aside the afternoon of Monday, 17th June from 2 to 4, transforming the Burke and Wills Room into the "Science Week Dispatch Centre!" We need some capable hands on deck to help us package up materials, label boxes and get all the Science Week gear out to libraries, community centres, schools, local governments and universities in metropolitan, regional and rural Victoria.

If you have some time you can spare to assist, we'd be grateful if you could register via this page so we can expect you on the day. Tea, coffee and snacks on offer!



We need up to 10 people to lend us a hand – we'd be grateful to have you in the mix. You can let us know with a call to the RSV office during weekdays, or you can **RSVP online** at: <https://rsv.org.au/events/science-week-dispatch/> .



Professor Sandra Rees FRSV

At the conclusion of the Society's Annual General Meeting on 9th May we were delighted to induct Professor Sandra Rees (BSc, MSc, MPhil, PhD, ScD, FRSV) as our newest Fellow of the Royal Society of Victoria, joining the distinguished ranks of a very select few!

Professor Rees' academic qualifications include Bachelor and Master Degrees in science from the University of Sydney, a Master of Philosophy from University College, London and a PhD from Monash University. In 2010, she was awarded a Doctor of Science from the University of Melbourne in recognition of her contribution to the field of neurobiology and neurosciences.

Sandra has supervised more than 20 PhD students to completion and 25 Honours and Masters' students. Further, she has been an

examiner for more than 15 Australian and international PhDs.

Prior to her appointment as a Professor in the Department of Anatomy and Cell Biology at Melbourne, she contributed to teaching undergraduate and postgraduate students at the Universities of Melbourne and Sydney, University College London and Monash University.

Professor Rees has been awarded numerous fellowships and scholarships, participated in many university academic committees and has been an assessor for national and international research grant bodies.

Sandra recently concluded a very active, decade-long involvement with the Council of the Royal Society of Victoria, including a star turn as Chair of the Science Program Committee and Research Secretary, overseeing the growth of our monthly program in terms of both frequency of events and attendance by fascinated audiences of members and the general public alike.



**Professor Sandra Rees FRSV
with RSV President David Zerman**

We are most grateful for the outstanding contribution of Professor Sandra Rees to science and the Australian science community, and proud to number her among our distinguished fellows. The full list of Fellows of the Royal Society of Victoria can be found online at <https://rsv.org.au/about-us/fellows/> .



It's beginning to feel a lot like National Science Week! The chill is in the air, and the rain is falling from the sky, so what better time of the year than to start warming ourselves up with the excitement of science.

Congratulations to our Victorian Seed Grant recipients

On behalf of the Victorian National Science Week Coordinating Committee I'm delighted to congratulate our Victorian Seed Grant recipients, and thank all of our applicants. We received fantastic applications this year, making it a tough job for our grant selection committee.

Vic Seed Grants – Community

Ballarat International Foto Biennale – To the Moon and Back Public Program (activities to explore the past, present and future of space travel alongside a photo exhibition at the Ballarat Municipal Observatory)

Discovery Science and Technology Centre Bendigo – Fly to the Moon (activities, movie screenings, demonstrations, planetarium show)

Greta Valley Landcare Group – BLUE – Community Screening (movie screening and activities to raise awareness about the issues facing our oceans, and tips reduce plastic use)

Southern Peninsula Concert Band – Music of the Heavens (space themed music performed by the Concert Band and astronomy presentations commemorating the 50th anniversary of the Apollo 11 moon landing)

The University of Melbourne – Stories from the cosmos: What Indigenous storytelling can teach us about memory, our highways and ourselves (panel discussion featuring a neuroscientist, writers, and an astronomer with expertise in Indigenous astronomical and geological knowledge)

Wangaratta Community Toy Library – Robot Kids Expo (interactive robotics and coding demonstrations and activities)



Vic Seed Grants – Libraries

Moonee Valley Libraries – STEM Fair

Warragul, Leongatha, and Wonthaggi Libraries– WGL Fizzics – Liquid Nitrogen Shows

Ballarat Library – Destination Moon and Beyond Show

Chiltern Library – Frogs and Why We Need Them

Ferntree Gully Library – Family STEAM Day

Deer Park Library – Science Week at Deer Park Library

Doveton Library – World of Robotics with the Brainary

Endeavour Hills and Pakenham Libraries – Big Science Shows

Corio and Leopold Libraries – Learning how science works with Mighty Maggots!

Cranbourne and Bunjil Place Libraries – Fizzle and Pop Shows by TwistedED Science

Sunshine Library – National Science Week at Sunshine Library

Sydenham Library – National Science Week at Sydenham Library

Geelong West Library – SEAing the Unseen’: Microbial corrosion in the marine environment

Coburg Library – Curious Kids Night

Creative Technology Hub, Hobsons Bay City Council Libraries – Mini Maker Meet



Cambridge University Press School Grants

Our thanks to **Cambridge University Press**, who are generously sponsoring four Victorian schools to assist them in running Science Week events for their local communities:

Alice Miller School – Re-vegetating the farm dams at school with native plants to stop erosion.

Mentone Girls’ Grammar – Women in Science Breakfast featuring Merryn York, CEO of PowerLink and electrical engineer.

Collingwood College – Family Science Night catering for a range of language and cultural backgrounds.

Rochester Secondary College – Science Immersion Week. Rochester’s year 10 students will engage the grade 6 students from local feeder primary schools in STEM based activities.

Don’t forget to register your event!

For those already well on the way with organising events, please make sure you register your event on the national site at <https://www.scienceweek.net.au/event-holder-registration/> .

Registering your event ensures that your event is officially counted as a National Science Week event, and we can support you with publicity or anything else you might need assistance with relating to your Science Week event. The more events registered, the more this helps us keep National Science Week running for the enjoyment of communities for many years to come.

Those running private events (not open to public audiences) are still encouraged to register their events – you can check a box that says private event when you register.

Any questions, please feel free to email me (details below). I’m here to help.



Want to run a Science Week event, but unsure what to do?



Run a brain break morning tea at your workplace. For more details and to register to receive the brain break pack (which includes resources and quiz questions) head to: <https://www.scienceweek.net.au/brainbreak/>

Run a trivia evening at your local pub or community centre. Keep an eye on the [National Science Week](https://www.scienceweek.net.au/) website, trivia kits will be released shortly.

Check out the helpful booklet with event ideas for libraries at <https://www.scienceweek.net.au/wp-content/uploads/2019/01/Science-Week-Library-activities-ideas.pdf>, and stay tuned for a new booklet coming soon with ideas for early childhood learning centres.

Host a science film screening:

- **Scinema** offer a community screening program during Science Week to support organisations and individuals to bring the best 2019 science films and documentaries to their communities. For more details visit: https://scinema.australiascience.tv/community_program/ .
- Coming to National Science Week for the first time in 2019, Film Outreach Australia is working with communities around Australia to screen the inspirational new feature film, **INVENTING TOMORROW**, across Australia. INVENTING TOMORROW follows the next generation of upcoming scientists from around the globe as they bring their revolutionary ideas to the World Science Fair. For more information about the program and to bring INVENTING TOMORROW to your community, follow the link: <https://filmoutreach.com.au/national-science-week/> .
- **2040** is an innovative feature documentary that looks to the future, but is vitally important NOW. Award-winning director Damon Gameau (That Sugar Film) embarks on journey to explore what the future could look like by the year 2040 if we simply embraced the best solutions already available to us to improve our planet and shifted them rapidly into the mainstream. For more information about 2040, and to organise a screening for your community, visit: <https://www.documentaryaustralia.com.au/films/4023/2040> .



SCINEMA

INTERNATIONAL
SCIENCE FILM
FESTIVAL 2019

Helpful resources for event holders

Head over to <https://www.scienceweek.net.au/get-involved/organise-an-event/> for helpful guides on how to plan and run public events (including tips for producing media releases, evaluation sheets, and even links to download colouring sheets for children's events!).

For schools, the **Destination Moon: More Missions, More Science resource pack and poster** produced by ASTA contains fantastic ideas and activities for the classroom and beyond. Download these resources from <https://www.scienceweek.net.au/schools/> .

A range of National Science Week **logos** and **science characters** can be downloaded from <https://www.scienceweek.net.au/get-involved/graphics-logos/> .

Questions?

I'm always up for a chat about events and how we can make science accessible for all Victorians through National Science Week, so please feel free to contact me via email.

- **Dr Renee Beale**, Victorian Science Week Lead, The Royal Society of Victoria
renee.beale@rsv.org.au

Science Gossip: the stories trees share

by **Catriona Nguyen-Robertson MRSV**



This article follows a ‘salon evening’ at the Royal Society of Victoria on 15 May titled “Science Gossip: Woodland Rumours & Thinking Trees,” featuring evolutionary ecologist Associate Professor **Monica Gagliano** from the University of Sydney, augmented reality artist **Anna Madeleine** from the ANU School of Art & Design, mycologist Dr **Sapphire McMullan-Fisher** from the Royal Botanic Gardens Victoria, composer and acoustic ecologist **Vicki Hallett MRSV** and environmental philosopher Adjunct Professor **Freya Mathews**.



The team! From back left: Ms Vicki Hallett, Freya Mathews, Sapphire McMullan-Fisher, Anna Madeleine. From front left: Monica Gagliano, Renee Beale, Catriona Nguyen-Robertson

What do we know about trees?

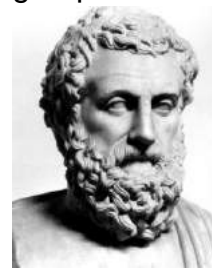
They provide oxygen, shelter, and filtered water, yet, as **Dr Renee Beale** (RSV’s Victorian Science Week Lead) says, we treat them as only ‘one rung higher on the ladder than inanimate objects.’ The inaugural Science Gossip event was held at the Royal Society of Victoria on the 15th of May. The event planted artists, philosophers, the public and scientists in common ground to discuss and unravel the secrets of forest communication, complexities and communities. Renee invited RSV members and guests to ‘really see trees.’

What do we say about plants, and what do they say about us?



A/Professor Monica Gagliano presenting.

Associate Professor Monica Gagliano was the keynote speaker of the night. She began her story over a millennium ago with Aristotle, who categorised souls into three hierarchical groups:



1. **Vegetative** (searching nutrients) – plants
2. **Sensitive** (sensing surroundings) – animals
3. **Rational** (thinking and speaking) – humans.

This effectively objectified plants, but today we know a lot more about them – and we know that they are indeed aware of their surroundings. They can see, smell, touch, and hear in their own way and usually respond to change by changing their growth rate, or direction of growth. Plants often turn towards, or grow towards the sun (or other light source) in a process called *phototropism*. They can also smell approaching insects and volatile signals

released by neighbouring plants. Some plants, such as the Venus flytrap, also feel, with leaves lined with tiny hairs that act as mechanoreceptors to sense contact by its prey, causing the leaves to snap shut.

Plants can also perceive sounds. Plant bioacoustics is a newly-emerged field of plant communication, and one that Monica is heavily engaged in. An orchestral symphony will have little effect on plants, however there are certain sounds that do trigger plant responses. Monica spoke about studies that demonstrated plants responding to their environments by “hearing”. Water in the soil is constantly moving, and the sound of water gives plants an idea of the direction they should grow their roots to ensure they have a return on their investment. Another [study from Tel Aviv University](#) revealed that primroses produce more nectar at the sound of honeybees, their pollinators, approaching. Conversely, a [team at the Swiss Federal Institute of Technology in Zurich](#) found that recordings of caterpillar munching sounds caused plants to produce chemical defences in their leaves to ward off attackers. Monica’s own research revealed that plants themselves can produce their own sounds at the lower end of the audible range and ultrasonic sounds.

While plants might not have eyes, ears and noses, they still have their own senses and communicate in difference ways based on what they’ve learned to be advantageous.



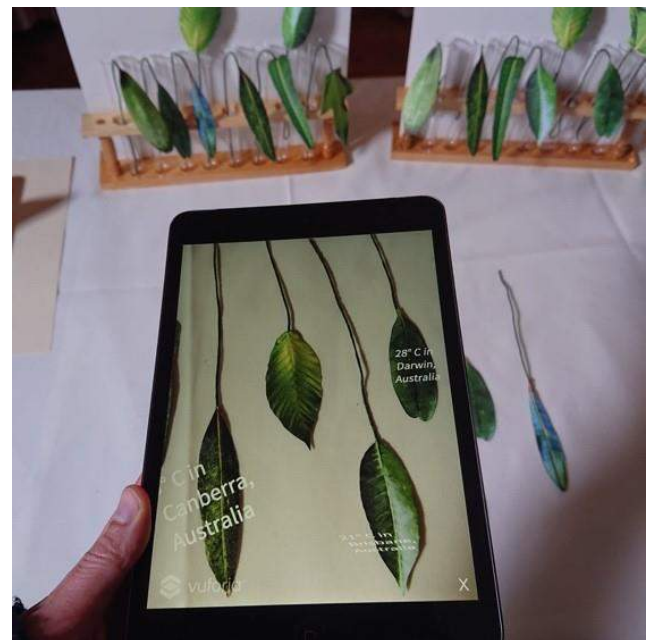
Artist Anna Madeleine in the Burke & Wills Room

At the conclusion of Monica’s keynote, audience members were divided into groups for interactive activities to explore a fusion of arts and science throughout the Society’s building. **Anna Madeleine**, an artist working

in mixed media and animation at the Australian National University School of Art and Design set up an augmented reality exhibition in the Burke & Wills Room. She scattered wooden circles, autumn leaves, and eucalypt leaves across tables for the audience to interact with using iPads.



Depending on the species and climate, the number of rings in a tree trunk is indicative of how old it is. Not only do they grow one ring larger every year, they can also record information about climate over time. Anna designed animations that tell stories about life the trees would have witnessed in their years.



The smallest woodcut had one animation of several butterflies passing by, and as the woodcuts increased in size, they had more and more animations stacked on top (lightning storms, wind, etc.). Anna also designed leaves that are linked to the Bureau of Meteorology so that they display the time of sunrise and sunset, and the temperature of Australian capital cities, in a harmonious blend of nature and technology.

Dr **Sapphire McMullan-Fisher** held a “fun-gi” Q&A session in the Cudmore Library. Surrounded by pictures of fungi, edible mushrooms, and fictional and factual books on the theme of mushrooms, the audience was invited to ask fungi-related questions.



Mycologist Dr Sapphire McMullan-Fisher in the Cudmore Library

They learned that fungi can be ‘used to fix up the messes that humans have made’ by absorbing and breaking down heavy metals and are also part of a wider community with plants – they live among plant roots to contribute decomposed nutrients and receive sugars in return. Sapphire highlighted the importance of fungi to plant ecosystems, despite the fact that they are often overlooked.



Environmental Philosopher Adjunct Professor Freya Mathews in the Von Mueller Room

The audience delved into the philosophical with Adjunct Professor **Freya Mathews** in the Von Mueller Room. She posed the question ‘*why are we plant blind?*’ The scientific method calls for objectivity, and when we

study plants, we are merely observers and led to believe that nature is mindless. Objectivity leads us to *objectify*. Now, science is revealing that nature is full of minds – belonging to both animals and plants. Freya encourages us to look at nature ‘not as an outsider looking on’, but to care of the land so that we can watch it thrive as it receives the nurture from us that it deserves.



Acoustic Ecologist & Composer Vicki Hallett in the Ellery Theatre

The evening was rounded off by acoustic ecologist, musician and sound artist Vicki Hallett. Vicki often performs around animals and in nature – she even jammed along with a snorting hippopotamus who was passing by as she stood on an isolated rock in South Africa. By placing microphones in the air, on the ground, and on the roots and branches of trees, she develops recordings that unveil the sounds of nature. She riffed with her clarinet, bass clarinet and a Tibetan singing bowl over the top of these sounds to create a beautiful, meditative piece. The resonating melody hung high in the air as Science Gossip closed for the night, and everyone left, with a few more stories about trees to share.

Gamble, Drink, Consume, Repeat: Breaking the Cycle

by **Catriona Nguyen-Robertson MRSV**

*This article follows a presentation to the Royal Society of Victoria by **Professor Murat Yücel** on 9 May, 2019 titled “Gamble, Drink, Consume, Repeat: Why we need Brain Park.”*

The term “addiction” can mean many things to different people. In general, it refers to the repeated use of a substance or behaviour, despite the harm or interference it may cause to everyday life. Most people associate addiction with alcohol and drugs, but ‘the net is quite wide’: 4% of adults are addicted to alcohol, 5% to drugs, 15% to tobacco, and 2% to each of gambling, internet, eating, and Obsessive Compulsive Disorder (OCD). Individually these may not be large numbers, but they collectively add up to a significant prevalence, and a lot of harm and stigma can be associated with these behaviours.



Professor Murat Yücel presenting to the Royal Society of Victoria

Despite the prevalence and burden of addictions, 80% of those who need help don't get it – whether that be due to stigma, costs, access, or other factors. The current treatment model involves treating people based on the substance or behaviour they are dependent on; however, there are usually underlying psychological reasons for their addictions that might not go away (i.e. treating someone for alcoholism who drinks due to an earlier trauma doesn't remove the injury of the underlying trauma). Professor Murat Yücel likens the system to multiple cars that have broken down and are sent off

to mechanics based on their colour rather than the problem (whether it's the battery, engine, etc.). Furthermore, receiving treatment and therapy are often not engaging or empowering experiences, and it's difficult to translate neuropsychological research into practice. It is time for a paradigm shift.

Professor Murat Yücel is the Director of BrainPark and the Brain and Mental Health Research Hub at Monash University. He set up BrainPark to make a difference. After not being so keen on science throughout high school and his undergraduate degree in psychophysiology, he changed his mind after hearing a visiting speaker talk about dementia in third year. Professor Yücel was intrigued enough to ask the speaker what path to take to do the same type of work and gained a PhD supervisor doing so! He combined his PhD with specialist training in Clinical Neuropsychology at La Trobe University, and continues to conduct interdisciplinary research combining clinical neuropsychology, psychiatry, neuroscience and technology.



Professor Yücel speaking with Dr Renee Beale MRSV in the Cudmore Library

Professor Yücel's curiosity stemmed from trying to link the brain and behaviour. Over time, he became more involved in mental health, realised that there's an important problem with addiction and wanted to use science to help. He worked across a number of mental health research centres at the University of Melbourne for 16 years, where he was doing well in terms of academic outcomes but remained frustrated at the disconnect between academia and clinic. He moved to Monash University (which coincidentally had a campaign “if you don't like it, change it” at the time), to shift from fundamental research to ‘more impactful,

intervention research'. There, he started a research program and needed a purpose-built facility for it that was 'like something that hadn't existed before'.

To this end, BrainPark was established last year. At BrainPark, researchers provide people with an alternative option to treatment and 'come at addictions and compulsions from a different perspective'.



BrainPark at Monash University, Clayton Campus

BrainPark provides mental and physical experiences by integrating lifestyle and technology. When 'everything we do, matters', eating, exercise, and other lifestyle choices are all important, and Professor Yücel is working to understand habit formation and leverage technology to improve outcomes for those who seek help.

The solution is to 'focus on underlying drivers, not surface symptoms of problematic behaviours'. Rather than assessing and focusing on a diagnostic "what", Professor Yücel and BrainPark are focusing on the "why". He worked with 70 clinical neuroscience experts in addiction and compulsion around the world to narrow down seven core drivers of addiction, many of which were based on rewards and emotions.

The therapy and treatment processes are much more empowering at BrainPark, as individuals put in effort during an 8-12-week program to learn lessons that they can have for the rest of their lives. There are multiple types of interventions undertaken, and researchers simultaneously assess how each changes "the why" behind addiction. The brain is malleable and neural circuits in the brain can be more open to change following exercise – multiple studies have demonstrated a correlation between more physical activity and less mental health burden and anxiety. BrainPark has therefore

incorporated spin classes, yoga, meditation and other activities as part of their programs.

To make the process more engaging, BrainPark also has a vigorous emphasis on gaming technologies and virtual reality (VR). Gaming has made it easier to engage young people and measure cognitive efforts and emotions as they go through their programs. Traditionally, individuals may have undergone addiction and compulsion exposure therapy that involved them imagining being in various scenarios. Having to use the imagination could be a mental challenge in itself, but now individuals can be placed in a virtual casino, home, etc. using VR. This way, individuals can be guided through a safe, but realistic world in conjunction with receiving psychological treatment based on their reactions to the scenarios.



Professor Murat Yücel (centre) with RSV President David Zerman (left) and Professor Sandra Rees FRSV (right)

By exploring underlying drivers of compulsion, Professor Yücel at BrainPark is changing the game for compulsion and addiction treatment. He is trying to understand the interactions between the person and the substance or behaviour, and developed gamified VR tools and other technologies to monitor these in combination with psychological treatment. These tools are more accessible and engaging (that are cheaper than ever before and can be downloaded to use anywhere). His goal is to combine lifestyle and technology to see better physical and mental health outcomes, and the empowerment of those who seek help.

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.

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.

The last recipient of the Medal in this category was **Professor David Karoly**.

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.

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 guidelines on nominations and eligibility are available from <https://rsv.org.au/awards-and-prizes/research-medal/>

Call for Applications: The Phillip Law Postdoctoral Award for Physical Sciences

The award is for excellence in scientific research by an early career researcher in the physical sciences. The award is open to suitably qualified post-doctoral candidates in the area of the Physical Sciences, which include Astronomy, Astrophysics, Chemistry, Mathematics, Physics, all branches of Engineering, and related sciences.

Eligibility:

Application is open to candidates within seven years (at the deadline of application) of the awarding of their doctorate from a University in the State of Victoria, Australia. Applicants must either be an Australian Citizen or have Australian Resident Status. The Society will consider adjusting the seven year window for candidates who have spent time as primary carers following their PhD – please contact the Society if this applies to you to discuss eligibility.



Applications opened on Tuesday, **1 May, 2019** and close at **5pm** on Saturday, **30 June, 2019**.

The Award: The successful candidate will receive an award certificate and a prize of \$3000.

The prize winner will deliver a 45 minute talk on their research to an audience of members of the Royal Society of Victoria and guests on **Thursday 19th September 2019** at 7pm at the Society's Hall.

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 guidelines on nominations and eligibility are available from <https://rsv.org.au/awards-and-prizes/dr-phillip-law-ac-post-doctoral-award/>

June Fundraiser

The Royal Society of Victoria is an independent, not-for-profit organisation, and a registered charity. Our ability to maintain our programs, promote science and foster universal scientific literacy in our community depends on membership subscriptions, as well as revenues from venue hire, sponsorship, donations and bequests.

Donations and Bequests

If you are considering your legacy, or are interested in contributing to the growth and success of the Society's projects and programs, we would gratefully welcome your generosity. **Bequests** to the Society can be stipulated in your legal will as a part of your legacy, and we would be pleased to discuss the conditions you would like to stipulate. **Donations** can be made at any time, either online at <https://rsv.org.au/about-us/support/> or using the form provided in this newsletter. These can be of a general nature, or you can specify the purpose to which your support should be directed. As a registered charity, all donations to the Society over \$2 are tax deductible within Australia.

A general donation will be directed to the Society's highest priorities, or you can review the program areas below to make a more specific contribution to our efforts.



Science Program – Presenting Science and Scientists to Victoria

The program at the Royal Society comprises an outstanding **public lecture series** on subjects ranging across the disciplines in Science, Technology, Engineering, Mathematics and Medicine (STEMM), along with a suite of **distinguished awards and prizes** to foster, recognise, reward and celebrate excellence at all stages of a scientist's career. It is our opportunity to learn more about progress in science, discuss issues together, and offer a broader promotional platform to scientists and their research with the general community.

Science is an important part of our state's cultural life, a point of inspiration not just for discovery and invention, but also creativity and expression. Increasingly, the arts community is finding ways to help scientists bring their work to a larger audience through the tools of literature, visual arts and music.

We extend the impact of the Program through the **upgrade of equipment** in our heritage Hall – this enables video recording and transmission of key events to reach a wider audience through both livestreaming and a YouTube channel, and also augments the live theatre experience for attending audiences through appropriate projection, lighting and amplification.



Science Outreach – Supporting Inclusion & Participation in Science

The future of science, and of our society, rests with the generations currently engaged in schooling and tertiary studies. The RSV's membership is deeply committed to the development of youth skills that will enable these generations to be productive, innovative and professionally agile in a challenging era of rapid technological, environmental and economic change. Sometimes this involves supporting teacher professional development, other times it involves engaging the whole of a family in the fun of a kids' science, robotics or coding club.

Further, the RSV supports a "lifelong learning," community-based approach to recognising and fostering engagement in the sciences across regional and metropolitan Victoria. This encompasses: fostering a deeper understanding of and appreciation for the environment that supports us; STEMM workforce diversity, inclusion and participation initiatives, and; citizen science programs. Increasingly, the provision of small science engagement grants to Victorian communities through managements of the Inspiring Victoria program is answering a clear requirement for science content, and your support would be appreciated in extending our resources to meet the growing demand.



Science Heritage - Buildings, History and Collections

The Royal Society of Victoria has a long and distinguished history of contribution to the civic and cultural life of Victoria. Founded in 1854, much of our story, and the story of science in Victoria, has been told, but much still remains to be discovered, understood and shared. You can help us to uncover and share these fascinating stories.

We have maintained our colonial collections, buildings and grounds on our small CBD triangle for almost 160 years, and hope to continue for many years to come!

The Society holds a beautiful collection of 19th century science journals, canvassing a broad range of disciplines, a legacy of its role in holding scientific intelligence for the reference of the Colony of Victoria. Housed throughout our heritage building, many of these volumes are in need of urgent conservation work and binding to complete runs. Your support in preserving these important cultural items as symbols our beginnings would be much appreciated.



Science Policy - Advocacy and Communication

One of the best ways to make a real impact is to get the right people talking to one another. In the sciences, this means recognising and including expertise, but this expertise means little if nobody is listening. Convening scientific expertise with communities and key influencers in government and industry is vitally important, as is the publication of robust science conducted in and about Victoria to inform debate and discussion.

Bringing the big picture together for a community of interest takes time, diplomacy, patience and resources. We aim to convene events that enable our members to share their professional experiences and expertise, contribute to public debate and deliberation, raise major issues in science and society, and bring the collective scientific wisdom of this accomplished community to bear on challenges facing our home here in Victoria, Australia. We publish the peer-reviewed work of Victorian scientists in the *Proceedings of the Royal Society of Victoria*, along with the occasional monograph, to establish an enduring and engaging reference to an evidence base.



Aboriginal Astronomy - Participation, Education & Research

The First Australians are among the earliest known astronomers in the world, having created complex knowledge systems about the Sun, Moon, and stars. Collaborations with elders are revealing a new wealth of knowledge that challenges colonial ideas about Aboriginal culture, catching the attention of the general public. Aboriginal and Torres Strait Islander people are severely underrepresented in all areas of astronomy. Our programs aim to create opportunities and pipelines for Indigenous students who are passionate about becoming astrophysicists and/or learning more about Indigenous Astronomical Knowledge.

Our programs focus on four primary areas: **Indigenous community engagement** to generate interest among students and community members in astronomy and space science; **research and education programs** for students studying Indigenous Astronomical Knowledge; **scholarships for Indigenous students** at all tertiary levels to pursue studies and degree programs in astrophysics, space science, and Indigenous astronomy and **meetings and workshops** for educators and Indigenous community members to share ideas and develop scholarship in Indigenous astronomy.

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Support the Royal Society of Victoria

Donations to the Royal Society of Victoria can be made at any time via the following methods:

Online: we can accept gifts through credit card and PayPal transactions on our website at <https://rsv.org.au/about-us/support/>

Via mail: the form **below** can assist you in allocating your donation to your preferred activity area, using either your credit card details (Visa or Mastercard), a cheque/money order made out to the Royal Society of Victoria, or notification of a direct Electronic Funds Transfer (EFT) transaction to the Society's bank account.

In person: we can accept donations at the Society's office in cash, cheque/money order or via credit card.

Donation Form

<i>Please allocate my donation to the following program areas:</i>	
Highest Priorities	Donation Amount
<i>The Area of Greatest Need, as Identified by the Society's Council</i>	\$
Science Program	
<i>Area of Greatest Need</i>	\$
<i>Filming RSV Events for Sharing with Audiences Online</i>	\$
<i>Upgrading Audio-Visual Equipment in the Ellery Theatre</i>	\$
<i>Awards & Prizes for Victorian Scientists</i>	\$
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Science Outreach	
<i>Area of Greatest Need</i>	\$
<i>Kids' Science Clubs</i>	\$
<i>Girls in Physics (with VicPhysics Teachers' Network)</i>	\$
<i>Citizen Science Programs (with Science for All)</i>	\$
<i>Gender & Cultural Diversity in STEMM Initiatives</i>	\$
<i>Community Lifelong Learning Programs</i>	\$
<i>National Science Week Community Grants Program</i>	\$
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Science Outreach Total:	\$
Science Heritage	
<i>Area of Greatest Need</i>	\$
<i>Repair & Refurbishment of the RSV's Heritage-Listed Buildings</i>	\$
<i>Conservation & Curation of the RSV's Heritage Journal Collection</i>	\$
<i>Victorian Science History Research Projects & Papers</i>	\$
Science Heritage Total:	\$

Support the Royal Society of Victoria

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Area of Greatest Need	\$
<i>Convene Senior Government & Industry Forums with Leading Scientists</i>	\$
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<i>Publish the Evidence Base Produced by Victorian Scientists</i>	\$
<i>Advocate on Issues Related to Science & Scientific Findings with Government</i>	\$
Science Advocacy Total:	\$
Aboriginal Astronomy	
Area of Greatest Need	\$
Indigenous Community Science Engagement	\$
Tertiary Scholarships for Indigenous Students	\$
Workshops with Indigenous Community Members and Educators	\$
Indigenous Astronomy Research & Education Programs	\$
Aboriginal Astronomy Total:	\$
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We will provide a tax receipt for all donations received over \$2.