The Royal Society OF VICTORIA

Promoting science since 1854

PATRON: The Hon Linda Dessau AC
Governor of Victoria

PRESIDENT: Mr David Zerman

March Events:

12th March: *Sustainable Solar Energy through Exciton Control – Dr Wallace Wong*

22nd March: *Wild Restoration at Organ Pipes National Park – Science for All*

23rd March: *National Science Week in Victoria, 2020: Information and Networking*

26th March: *AQFx – an Australian Smoke Forecasting System – Dr Martin Cope*

Advance Notice:

2nd April: *Volcanoes: From Fuming Vents to Extinction Events – Professor Tamsin Mather*

9th April: *Ockham's Razor at the RSV*

16th April: *Breaking the Barrier with Antimicrobial Peptides – Professor Frances Separovic AO*

29th April: *Media and Communication Training for Scientists – Science in Public*

30th April: *STEMM Fundraising Success is not Accidental – David Zerman*

14th May: *RSV Annual General Meeting (for 2019), followed by:*
Why Marsupials are Marvellous – Professor Marilyn Renfree AO

March 2020 Newsletter

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Melbourne Victoria 3000
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rsv.org.au

Sustainable Solar Energy through Exciton Control

Thursday, 12th March at 7:00pm

Ensuring energy security as we transition towards renewable resources is a major challenge for governments around the world. While there are many competing technologies, solar is without doubt an irreplaceable component in the energy generation mix. To increase the contribution of solar, much research is being dedicated to improving the efficiency and lowering the costs of the technology.

Excitons are formed when light is absorbed by a material. In solar cells, excitons dissociate into free charges, resulting in electric power. Understanding and controlling the fate of excitons is key to improving existing technologies, as well as developing new ones.

Join Dr Wallace Wong, who will present and discuss emerging solar photovoltaic technologies, with a focus on Australian and Victorian research.

About the speaker:

Dr Wallace Wong was born in Hong Kong and educated in Sydney, Oxford and Zürich. He is a Senior Lecturer at the School of Chemistry, University of Melbourne and is a Chief Investigator in the ARC Centre of Excellence in Exciton Science. His research interest is in functional organic materials – synthesis, characterisation and applications in light harvesting, chemical sensing and biological imaging.

Australian Research Council Centre of Excellence in exciton science

This RSV lecture is proudly presented in partnership with the **ARC Centre of Excellence in Exciton Science** as a part of the “Light Conversations” lecture series.

Eventbrite

Places limited, bookings essential! *Cocktail function commences from 6:00pm.* **Register online** now at https://rsv.org.au/events/exciton-control/, 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 entering their **promotional code** in the online ticketing window.

Wild Restoration at Organ Pipes National Park

Sunday, 22nd March from 11:00am to 5:00pm

This event is partly funded by a grant from **Brimbank City Council** and public donations. Thank you to the **Friends of the Organ Pipes National Park** for their support of this event. For a detailed and up to date itinerary please visit https://ScienceForAll.World/Events.

AQFx – an Australian Smoke Forecasting System

Thursday, 26th March at 7:00pm

The 2019-20 summer has seen massive fires across eastern Australia, with over 10 million Ha of land burned since September 2019. There has been tragic loss of life and devastation to ecosystems and infrastructure. There has also been significant levels of smoke exposure across the region, with approximately 10 million people experiencing elevated concentrations of PM2.5 (particles less than 2.5 micrometres in diameter). Exposure to fine particles for prolonged periods of time is well known to increase levels of morbidity and mortality amongst vulnerable members of our population. In this respect, the forecasting of pending smoke impacts is one tool that can be used to mitigate health risks, by providing advanced warning for effected people to take preventative medication, seek safe havens, or modify outdoor activities.

The Bureau of Meteorology (BOM) routinely forecasts smoke from bushfires and prescribed burns using AQFx, an air quality forecasting framework which was originally developed for the Victorian Department of Environment, Land, Water and Planning (DELWP) to aid in the management of smoke from prescribed burns. This summer AQFx has been extensively used for forecasting bushfire smoke exposure, and also as input to visibility advisories for general aviation and the ADF.

Developed by a CSIRO, BOM, and a consortium of universities, the AQFx technology includes monitoring of fire propagation, smoke emission, smoke transport, smoke chemistry, population exposure, and communication modules. Join atmospheric scientist Dr Martin Cope to explore the major science components of AQFx and the use of the system to forecast smoke using case studies taken from both the current and historical bushfire and prescribed burn episodes.

About the speaker:

Dr Martin Cope has worked in the area of air quality modelling and applications for over 30 years. He is currently working at CSIRO as a Principal Research Scientist in the Climate Science Centre. His principal area of research has been the development of models which describe the sources and formation of gaseous and particulate air pollution in the Australian atmosphere. Most recently he has been working on smoke forecasting in collaboration with the Bureau of Meteorology, universities and state government agencies.

Areas of research in which Martin has been involved have included investigating the relationship between climate change and air quality; simulating the sources and sinks of particle formation in urban and rural environments; investigating the impact of alternative motor vehicle fuels on urban air quality and the burden of disease; investigating the relationship between intra-urban pollution sources, population exposure and health impacts and investigating the transport and production of secondary inorganic and organic aerosols.

Places limited, bookings essential! *Cocktail function commences from 6:00pm.* **Register online** now at https://rsv.org.au/events/aqfx/, 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 entering their **promotional code** in the online ticketing window.

Impact7 – Towards a Better Tomorrow

Tuesday, 24th March

Storey Hall, RMIT University

Itching for a window on the future? Want to play your part in amplifying opportunities for a better tomorrow? Collectively we can build a better society, economy and environment. Attend IMPACT7 2020 to help empower solutions that are building the future we need.

The Royal Society of Victoria is proud to support IMPACT7 2020 as it helps create value by sharing stories, igniting connections and amplifying opportunities.

Short, 3-minute presentations by researchers and entrepreneurs will share how they are contributing to eradicating disease or poverty, ensuring the security of our food for generations, preserving our natural environment, or reinventing the future of our industries.

IMPACT Leaders across 7 impact areas – carbon, congestion, connectedness, integrity, productivity, scarcity and vitality – will discuss, question and guide.

An amazing opportunity to witness first-hand the cutting-edge research making a difference. You will hurt your head, make meaningful connections and leave with inspiration to burn!

Registrations:

https://www.impact7.com.au/2020/register/

Volcanoes: From Fuming Vents to Extinction Events

Thursday, 2nd April at 7:00pm

*A joint presentation with the Monash **School of Earth, Atmosphere and Environment**.*

Volcanoes are spectacular natural phenomena. They have shaped our planet and have been key in creating and maintaining its habitability. However, they can also be deadly natural hazards and are implicated in some of the greatest environmental crises in Earth's history, such as mass extinction events.

Earth has experienced volcanism since its beginnings and observing a volcanic eruption is a truly primeval experience. We see a great range of different types of volcanic activity on our present-day planet, but the geological record reveals that there are also styles of activity not yet seen in historical times.

Join UK volcanologist Professor Tamsin Mather, who will explore some of the hazards and environmental impacts of these different types of volcanic activity. How can volcanoes erupt in so many different ways? And what lessons can we learn sitting on the edge of an active volcano today that give us insights into some of the most profound global changes in geological history, including mass extinction events?

About the speaker:

Professor Tamsin Mather is a volcanologist based at the University of Oxford, UK where she has been on the faculty since 2006. She received Masters degrees in Chemistry and History and Philosophy of Science from the University of Cambridge and, after a year working in Germany and then Brussels doing a placement for the European Commission, she returned to Cambridge, completing a PhD on the atmospheric chemistry of volcanic plumes and their environmental effects in 2004.

Before joining Oxford she was seconded to the UK Parliamentary Office of Science and Technology, and a Royal Society Dorothy Hodgkin Research Fellow. She won a UNESCO/L'Oréal UK & Ireland Women in Science award in 2008, the Philip Leverhulme prize in 2010, was UK Mineralogical Society Distinguished Lecturer in 2015/16 and winner of the 2018 Rosalind Franklin Award from the Royal Society. She has spoken at numerous science and participated in several TV and radio programmes including BBC Radio 4's Life Scientific and The Infinite Monkey Cage.

Professor Mather is visiting Australia as the 2020 Distinguished Lecturer in the **School of Earth Atmosphere & Environment** (SEAE) at Monash University.

Photo: "Fimmvörðuháls Eruption, Eyjafjallajökull - Iceland 2010" by James Appleton

Places limited, bookings essential! *Cocktail function commences from 6:00pm.* **Register online** now at https://rsv.org.au/events/volcanoes/, 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 entering their **promotional code** in the online ticketing window.

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

Friday, 9th April at 7:00pm

2019 Speakers

Got ten minutes? Let us tell you a story…

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 on a range of compelling topics. Expect a jam-packed evening of short talks that will intrigue, excite and inspire. Details on this year's speakers will be coming soon. Meanwhile, book now to ensure your seat at this popular annual event!

You can listen to Ockham's Razor now via ABC Radio National, iTunes or wherever you get your favourite podcasts.

Places limited, bookings essential! *Cocktail function commences from 6:00pm.* **Register online** now at https://rsv.org.au/events/ockhams-razor-2020/, 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 entering their **promotional code** in the online ticketing window.

Media & Communication Training for Scientists

Wednesday, 29th April and Friday, 26th June

The RSV continues to partner with Science in Public to deliver their flagship media training program to scientists in Victoria.

Meet local journalists and learn how to ensure your research is reported accurately.

Practice being interviewed on tape on and in front of camera by real journalists.

Find out how the media works and how you can make it work for you.

Gain confidence in talking about your research so that it has impact with media, government, industry and other stakeholders.

Conveying the complexity of your research, your life's work, into a 30-second grab for the media or one-minute elevator pitch to media, funders, or even a Vice-Chancellor, can be hard. The solution is to shape the essence of your science into a story.

This is a full day hands-on workshop where you will learn how to effectively communicate about your work to the public, stakeholders, government, industry and the media.

You will meet and talk with journalists from television, print and radio; and you'll get the chance to do some practice interviews.

Two experienced science communicators will work with you to find the story in your research. Over the years we've helped Monash launch the world's first printed jet engine, revealed the loss of half the coral on the Great Barrier Reef, helped CERN announce the Higgs boson, and revealed the link between CSIRO's Wi-Fi patent and Aussie astronomy.

We will help you find the right words to explain your research in a way that works for the media, as well as for government, industry and other stakeholders.

The day's insights and training will help you feel more comfortable in dealing with journalists when media opportunities arise.

Depending on numbers, the RSV makes a limited number of free places available to early career researchers in our membership; please enquire at rsv@rsv.org.au if you would be interested in taking up the opportunity.

The full cost is **$800 +GST** per person, and includes morning tea, lunch and afternoon tea.

Eventbrite

Register online now at https://rsv.org.au/events/media-training-2020/ . Prefer an invoice? Email Tara Benson at tara@scienceinpublic.com.au . Want to chat about something specific? Give Sarah or Tara a call on (03) 9398 1416.

STEMM Fundraising Success is not Accidental

Thursday, 30th April, 9:00am to 4:00pm

Fundraising is often seen as a difficult activity, especially in the STEMM sector. There are more than 650,000 Not-For-Profits (NFPs) currently operating in Australia, including more than 56,000 with tax deductibility, all competing for limited private resources. The most recent figures indicate that nearly 15 million people gave a total of $12.5 billion to Australian charities and NFPs – which averages out at roughly $833 per person, or $19,230 per organisation.

Successful fundraising requires strategy and a detailed action plan to succeed. In this very interactive workshop, RSV President David Zerman will share secrets that have enabled him to lead and work with teams that have raised and disbursed more than $220 Million over the past 30 years. You will be introduced to the following essential elements that will contribute to the success of your fundraising:

- Why people support an organisation
- Why people volunteer for an organisation
- Postcode 3163
- Cholera
- Food
- Ice Cream
- The fundraising pyramid
- The fundraising communication ladder
- 4 Golden Rules
- 3 Songs
- Zerman's fundraising equation
- How to ask for support
- Development of a series of practical fundraising issues in the STEMM sector

Please note that this workshop focusses on providing participants real world fundraising strategies and programs. This is not a workshop about seeking NHMRC and ARC grants. The cost of the workshop is $550 (plus GST), which includes:

- Pre-Workshop Reading
- Comprehensive workshop notes – made available after the workshop
- RSV Pad and Pen
- Pre-workshop coffee/tea, morning tea, lunch and afternoon tea
- An RSV Certificate of Completion

As this is a tailored workshop with limited places available, there is a restriction of a maximum of two participants from each organisation please. The first 10 registrants will be able to have a 30-minute fundraising consultation with David in the 2 weeks following the workshop. David is donating his expertise and time and, as a result, all proceeds go to supporting the RSV's statewide science engagement programs.

About David Zerman MRSV:

In addition to being the President of the RSV, David is the Fundraising Epidemiologist and CEO of Possibility Australia, with a 30 year fundraising career that has included being CEO of the Royal Flying Doctors Service Victoria, Executive Director of the Royal Melbourne Hospital Foundation, CEO of the National Stem Cell Foundation, General Manager of the Priscilla Kincaid-Smith Kidney Research Foundation, and Adjunct Professor of Fundraising and Resource Mobilization at Hanoi University's Faculty for International Studies.

Register online now at https://rsv.org.au/events/stemm-fundraising/ . Fully subscribed **RSV Members** can access discounted places by registering via their online profile, or entering their **promotional code** in the online ticketing window. Prefer an invoice, or need more details? Please email the RSV at rsv@rsv.org.au

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Nominations for RSV Membership

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

Mr Matthew James Clyde **BLAMPEY**, HSE Manager
Ms Elissa Yvonne **GOODRICH**, Composer & Performer

Unless Members request a ballot, these will be considered by Council and if elected, will be announced at the Ordinary Meeting of the Royal Society of Victoria to be held on 16th April 2020. Recently elected members who have not yet signed the Society's membership book are warmly invited to attend the 12th March meeting to be formally welcomed as members. **Please inform the office if you plan to attend, so we can prepare your membership certificate and welcome pack for collection.**

Please Renew Your Membership

As a membership organisation we rely on your active subscription to maintain our programs and govern our Society. Please ensure you are a financial member.

Further prompts have recently been emailed to all members due for subscription renewal; you can call the RSV office on 9663 5259 to renew over the phone, or log on to your membership profile at https://www.joinit.org/o/rsv/members to renew online.

Australia Day Honours 2020

Our belated congratulations to an interstate RSV member acknowledged with an honour within the Order of Australia on Australia Day:

Dr Joseph Vaughan Johnson CSC OAM AAM RFD ED

For service to veterans, and to the community.

From the President

New RSV Fellows

I am delighted to advise the RSV Council Meeting of 27 February unanimously agreed to appoint four leaders in the Victorian science community as Fellows of the Royal Society of Victoria.

Being elected a Fellow is the highest membership honour the Society can bestow on a person and entitles the Fellow to use of the postnominals 'FRSV.'

The four Fellows (in alphabetical order) are:

Dr Tom Beer FRSV

A long-standing member of the Royal Society of Victoria, Dr Beer has served the RSV as a Councillor on two occasions, most recently contributing to our efforts in Policy and Advocacy. He has made globally significant contributions in atmospheric science, including to our understanding of increased bushfire risk from a changing climate, serving as a lead scientific advisor to the national EPA and CSIRO. He was a lead author for the Atmosphere Theme Report of the Australian 2001 and 2006 State of the Environment reports. He was a member of the IPCC Expert Group on Greenhouse Gas Emissions from Waste, and also a lead author for the chapter on waste in the IPCC Special Report on Technology Transfer. His work in risk assessment methodology led to the establishment of the International Union of Geodesy and Geophysics (IUGG) Commission on Geophysical Risk and Sustainability, serving as the foundation Chair and subsequently the first Australian President of the IUGG.

Professor Jenny Graves AO FRSV

Professor Graves is a long-standing member of the Royal Society of Victoria, most recently supporting our efforts with the Inspiring Victoria program as a keynote speaker. She began lecturing in genetics at La

Trobe University, where she then became Professor in 1991. She has published numerous high-profile papers and has made a seminal contribution to understanding the organization, evolution, function and conservation of the mammalian genome. Among many discoveries, her work has led to significant and influential new theories on the origin and evolution of the human sex chromosomes and sex determination, including the controversial prediction that the human Y chromosome is disappearing. Graves was elected as Fellow of the Australian Academy of Science in 1999, serving the Academy first as Foreign Secretary, then as Education Secretary. She has received many awards for her work, including the MacFarlane Burnet Medal for research in biology, and as an Officer of the Order of Australia. In 2017 she was awarded the Prime Minister's Prize for Science for "her pioneering investigations of the genetics of sex".

Professor Pauline Ladiges AO FRSV

Professor Ladiges is a long-serving RSV member who has served as a Councillor and the Society's Vice-President. She began her career as a plant ecologist, moving into phylogenetic systematics and historical biogeography, which enable her to refine and implement advanced methodologies to define the relationships between the major groups of Eucalypt species. Throughout her research career she has been a committed teacher, attaining a Diploma of Education to inform her work with students at tertiary and secondary levels. As head of the University of Melbourne's School of Botany, she worked to address the deficit of skilled taxonomists in Australia by creating links with the Royal Botanic Gardens Victoria, where she served as a board member for many years. She was elected a Fellow of the Australian Academy of Science in 2002 and has made significant contributions to the Academy's educational outreach programs. Pauline was appointed an Officer of the Order of Australia in 2009 for service to the advancement of botanical science.

Dr Peter Thorne AM FRSV

Dr Thorne is a long-serving RSV member who has served as a Councillor and the Society's Vice-President. He was formerly the Head of the Department of Computer Science at The University of Melbourne and Deputy Dean of the Faculty of Engineering until 1999. He has been a member of numerous State and Federal advisory boards and was the Director of Computer Forensic Services Pty Ltd: a company providing expert advice in computer disputes and litigations. Over the past two decades Peter has led a team researching and documenting Australia's pioneering achievements in computing, including the role of CSIRAC, Australia's first digital computer, designed and built by CSIR scientists in 1949. As Vice-President, Peter led the Royal Society's Burke and Wills sesquicentenary program in 2010 and was recognised for his contributions to computer science education and to history as a Member of the Order of Australia in 2020.

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Our four new Fellows will be formally inducted as part of the Society's Annual General Meeting program which will be held on T**hursday 14 May between 5 and 8pm.** Please mark this event in your diary. You will receive an invitation with full details, including an address by **Professor Marilyn Renfree AO**, in late March.

On behalf of your Council, please join me in congratulating our four new Fellows.

- **David Zerman**
  President, RSV

Here Comes 2020!

We're back and ready to roll out another big year for the Inspiring Victoria program. We have grants to offer communities across our state and Australia's biggest celebration of science to organise, National Science Week, coming back around in August.

New Faces

With great sadness I advise our fearless leader **Dr Renee Beale** is taking a step back from her duties as Victorian Science Week Lead to focus on family and life in her native Geelong. We owe Renee a great debt for the considerable energy and dedication she has brought to the role. Happily, Renee will still be with us as Curator and Producer of 'Possible Impossibles,' our next major event with the Parliament of Victoria during National Science Week, so you can look forward to more of her amazing talents as a convenor of fascinating talks, conversations and performances. Renee remains with the RSV in this capacity and is contactable on renee.beale@rsv.org.au .

The silver lining is that we welcome the fabulous **Ms Rena Singh** as our new Manager, Inspiring Victoria! Rena comes to us from a recent role as a manager with the CSIRO STEM Professionals in Schools program and, earlier, the manager of our sister Inspiring Queensland program. Rena has strong credentials in community development and science engagement – she has been closely involved in our Victorian program since moving to Melbourne in 2019 and we're very fortunate to have such an excellent individual available to take leadership of this most worthy initiative.

Rena will be looking after the year-round program, including National Science Week, and is contactable at rena.singh@rsv.org.au .

- **Mike Flattley**
  CEO, RSV

Information and Networking

Monday, 23rd March

We are delighted to once again bring together Victoria's National Science Week program for August 2020. The Royal Society of Victoria warmly invites everyone interested in being a part of this state-wide celebration of all things Science to come along to our information and networking session here at the Society's historic headquarters. Joining us will be Victoria's Lead Scientist and Chair of the Inspiring Victoria initiative, Dr Amanda Caples, and National Science Week Manager, Geoff Crane. You'll also meet our new Manager of the Inspiring Victoria program, Ms Rena Singh.

We will provide information on our small grants program for 2020, our public launch event with Museums Victoria, our major event with the Parliament of Victoria, and how you can get involved in National Science Week **(15 - 23 August)** as well as our year-round science engagement program. You'll also hear from several organisations about their planned events for 2020 and have the opportunity to network with your friendly science community colleagues over morning tea at the Royal Society of Victoria.

If you're thinking about hosting or supporting a National Science Week event, looking for collaboration or just want to know more about the planned Science Week activities in Victoria, please register to join us at https://rsv.org.au/events/science-week-2020/ .

New Scientist Live Joins Victoria's National Science Week!

14 – 16 August 2020
The Royal Exhibition Building, Melbourne

The world's greatest science festival is coming to Melbourne! Off the back of successful shows in the United Kingdom, New Scientist Live is launching during National Science Week, our much-loved community celebration of discovery and knowledge.

We are delighted to welcome New Scientist Live to National Science Week, a three-day, STEM-based science festival filled with interactive activities, features, experiments, virtual reality, AI and much more. Prepare to be inspired, see the latest technologies, engage with real scientists and learn from the best of the best.

Inspire the next generations interest in STEM, showcase your research and innovation, inspire more women to pursue careers in STEM, increase your brand's exposure to a highly engaged and curious audience, launch new technologies and so much more!

New Scientist Live Australia brings to life a show full of immersive and interactive experiences for young and old. The show is content rich, with three theatres on the floor showcasing your favourite scientists and speakers, discussing different topics from space, climate, environment, robotics, digital technology, engineering, the human body and beyond.

Want to be part of the world's greatest science festival?

There are opportunities for exhibitors, partners and presenters available across the three days of the show.

Who attends New Scientist Live?

- Science professionals
- Educators
- School and university aged students
- Parents
- Adults and children interested in science
- Adults and children looking for a fun day out
- People looking to enjoy something new and interactive
- Those seeking career advice and contacts
- Those seeking inspiration

For exhibitors and presenters, your visitors are your target audience, your customers and your future employees. New Scientist Live is the opportunity to demonstrate to them the smart thinking and smart people behind your brand and deliver an unparalleled level of outreach.

See the New Scientist Live website for more information: https://newscientistlive.com.au/ .

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.

Who can apply?

In 2020 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 possible auspicing, support, and/or collaboration. Not all organisations will be capable of auspicing you, depending on their local governance requirements, so it's best to consult in advance.

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, access the online application form from https://inspiringvictoria.org.au/grants/partnership-network-grants/

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.

If successful, what is required?

If your grant application is successful, your organisation will be required to sign a "grant acknowledgement" which outlines what is needed to acquit the grant.

Contact us to discuss your idea

We recommend that you contact us prior to submitting an application. Please contact the Royal Society of Victoria at rsv@rsv.org.au or on (03) 9663 5259 during business hours.

The 2020 Queers in Science Lecture Series

*Held over January and early February, these three lectures were held in partnership with **Queers in Science**, an initiative aiming to build community and improve support for LGBTQIA+ people working in STEMM professions. The lectures were timed to coincide with the 2020 Midsumma Festival.*

Exploding Binaries: Stars and Genders

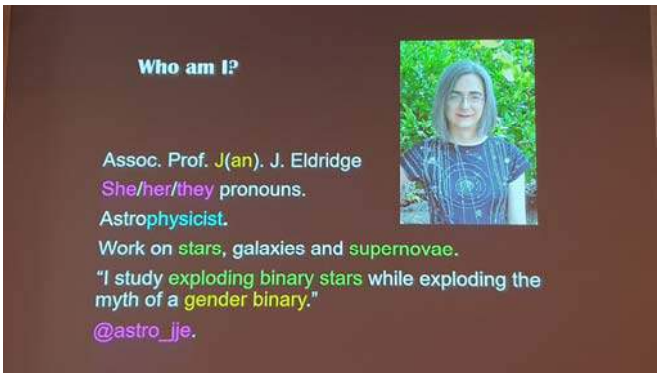
by Catriona Nguyen-Robertson MRSV

*This article follows a presentation on 16 January, 2020 by theoretical astrophysicist **Associate Professor JJ Eldridge** from the University of Auckland to the Royal Society of Victoria.*

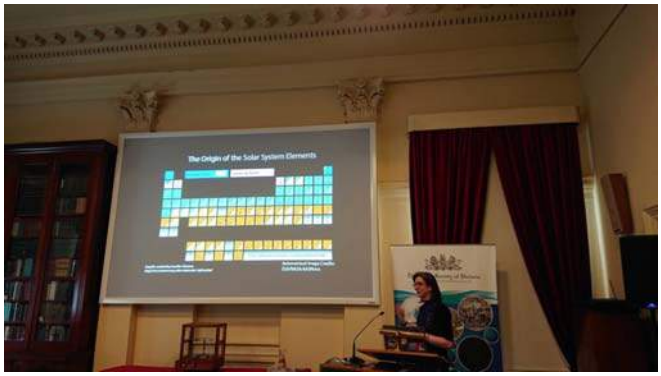
Associate Professor JJ Eldridge has always been unique. Their brother is a hands-on person, their sister is an engineer, but they were always best at learning and sitting exams. JJ loved maths and science and watched *Star Trek: The Next Generation* and *Doctor Who* growing up.

Going to the University of Cambridge to become an astrophysicist was the closest they could get to the stars. With a stellar career to date, undertaking postdoctoral research at the Institut d'Astrophysics de Paris, Queen's University Belfast and the Institute of Astronomy in Cambridge, JJ is now a theoretical astrophysicist at the University of Auckland. Throughout their journey, they have been a strong advocate of LGBTI+ inclusion both within their university and internationally.

JJ first shared their personal story in breaking the gender binary. They are still discovering their nature and likens the unsettling process to The Doctor's regenerations, quoting "it is painful to work out who you are". Gender issues also have been more directly addressed in *Star Trek*, in which, among an androgynous species called the *J'naii*, it is cisgendered people who feel out of place. Perhaps that says something for what is to be found among the stars; JJ observes that "[people] are the most complicated thing in the Universe," reflecting that, while they are themselves a non-binary individual, their research focuses on the evolution of binary stars.



Almost all of the elements in the Universe were forged in the merging and exploding of ancient stars. Hydrogen and helium trace their origins back to the Big Bang and a couple of small elements can be attributed to cosmic rays – high-energy radiation from outside the Solar System. But the rest come from the stars (excluding man-made elements).



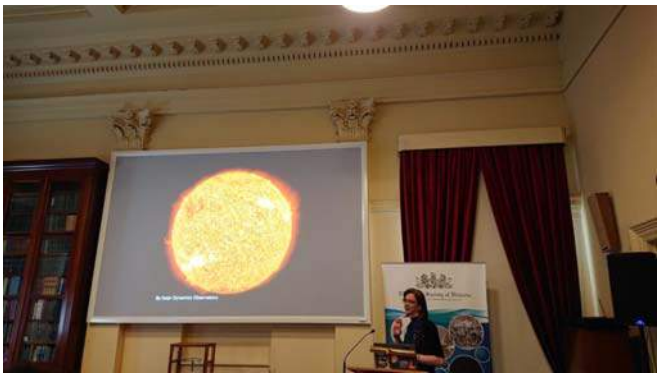
Elements are defined by the number of protons they contain in their nucleus. To create a new one, more protons need to be squeezed into an atom's nucleus in a process called nuclear fusion. Stars first fuse hydrogen atoms into helium inside their core, which act as thermonuclear furnaces. Then helium atoms fuse to become beryllium, and so on.

Lower-mass main-sequence stars, like the Sun, accumulate helium in their core as a result of hydrogen fusion, but for most of their lives, the core is not hot enough to create larger elements. Once all the hydrogen at the core of the star has been converted to helium, energy stops being generated by nuclear fusion. The core begins to contract due to its own gravity and the internal temperature rises, igniting a hydrogen envelope surrounding the inert core. With increased luminosity from the burning shell, the star becomes a red giant. Eventually, the contracting core reaches temperatures high enough to convert helium into carbon.

Once the core helium of a red giant is exhausted, an analogous process occurs, and the star starts to collapse once again. At this point, it has both helium and hydrogen shells which continue to burn. This puts the star onto the *asymptotic giant branch*, a second red-giant phase, and at its core are the elements carbon, nitrogen and oxygen – a result of helium fusion. Thus the elements key to DNA, proteins, lipids, and carbohydrates – the building blocks of life – are born out of dying, low-mass stars.

The core of massive stars that are 8-20 times the mass of the Sun will continue along this process of core burning followed by core contraction and shell burning, is repeated in a series of nuclear reactions producing successively heavier elements until iron is formed in the core. This is the end point for a star, as iron cannot be burned into heavier elements because that reaction would require energy (whereas up to this point, nuclear fusion has released energy). The star runs out of fuel and collapses.

The point of death of a massive star or white dwarf is the basis of life for many other chemical elements. In a star's last second of life, its core compacts tightly and then explodes with the energy of an octillion (10^{27}) atomic bombs. Intense heat from this violent explosion catalyses nuclear reactions not previously possible in the core to give rise to more than half the elements on the periodic table.



When giant stars die in supernovae and their cores collapse, their protons and electrons essentially melt into each other to form neutrons. They become neutron stars – essentially the largest neutrons in the Universe. At this point, they are so dense that their core is merely the size of a city while having a mass 1.5 times that of the Sun.

Binary stars are two stars that orbit a common centre of mass, that is, they are gravitationally bound to each other. When two neutron stars orbit each other as binary stars, there is the rare occasion in which they merge. This literally shakes the Universe as the merging neutron stars send out gravitational waves and create heavy elements, such as gold. As JJ pointed out, you can thank the rare merger of neutron stars for your gold and silver jewellery.

Over billions of years, stars are born, age and finally die. As they evolve, they give rise to different chemical elements. Merging neutron stars give rise to gold. Exploding white dwarfs make the calcium in our bones. Dying massive stars release the iron that makes our blood

red. Smaller dying stars and red giants produce the essential elements of life: carbon and oxygen. As someone who began their science journey immersed in science fiction, JJ has certainly learned that there is life among the stars and that we are all made of stardust.

The Science Behind Sexuality and Gender

by Catriona Nguyen-Robertson MRSV

*This article follows a joint presentation on 30 January, 2020 by biological scientist **Professor Andrew Barron** from Macquarie University and medical scientist **Dr Riki Lane** from Monash University to the Royal Society of Victoria.*

How did homosexuality evolve? Does it have a biological basis?

Professor Andrew Barron posed these questions to the audience at the Royal Society of Victoria. But he then iterated that these are not in fact the right questions to be asking. As a neuroethologist, studying the neural mechanisms of animal and insect behaviour, he has observed homosexual behaviour throughout the animal kingdom. '[Homosexuality] is not uniquely human.'

Professor Andrew Barron

Animals, including humans, are born with innate behaviours to provide them with advantages for survival in response to different environmental stimuli. Genes are increasingly being considered as contributors to complex behavioural traits such as sexuality and gender differences in combination with environmental factors and influences. Previous family and genome-wide association studies have revealed that sexual orientation is between 30-40% hereditable (Sanders, Beecham et al. 2017), which is the same amount of heritability that contributes to birthweight, and more than what contributes to whether we are left- or right-handed.

Human sexuality is a continuum, much in the same way that height and weight are. Not everyone fits into the categories of strictly straight or strictly gay. If the variation between individuals is collapsed to a binary then the focus becomes on asking why one end of the spectrum exists, when the better question would be to ask how variation in sexuality evolved and came about.

When thinking about evolution, we often think of Darwin's "survival of the fittest" theory; that those with particular survival advantages pass their genes on to their offspring. Andrew introduced the homosexuality evolutionary paradox: homosexuals, on average, will pass on their genes at a lower rate – so any variation in genes contributing to homosexuality would be expected to be lost as they are not passed on to the next generation as frequently. But sex is about more than just reproduction. It plays a role in various social contexts and therefore has social benefits as well as reproductive ones that have to be considered.

Brian Hare, professor of evolutionary anthropology at Duke University, wrote about his idea of "survival of the friendliest", in which recent human cognitive evolution has been selected for prosocial behaviour (Hare 2017). It is beneficial for a species like ours to be sociable, and sex can be a part of that. The idea that Andrew poses is that perhaps as humans and other animals increased their social cognition, there was an increase in diversity among sexual behaviour and rise in

sociosexuality (uncommitted sexual relationships).

Dr Riki Lane

Dr Riki Lane, Research Fellow at Monash Health, asks if the "why" behind sexuality and gender even matters? There are two sides of the coin when we search for biological reasons to explain sexuality and gender: while people may find comfort in the "born this way" argument, looking for a "gay gene" can indicate a level of non-acceptance. They agree with Andrew in that dichotomising sexuality and gender ignores the continuum or clusters of individuals who don't fall into one of two and only two categories and we can fall pretty to thinking that one is "normal".

Riki has explored the scientific evidence societal views on the psychosocial and biological factors used to explain gender and sexual diversity. Theories of gender have 'waxed and waned' over time: it was once a sin to be gender diverse, then a curable pathology, and now a healthy variant.

There is evidence to suggest that transsexuality is strongly associated with the neurodevelopment of the brain: that pre-natal hormones and genetics lead to differences in cognition, behaviour and identity between males and females. This evidence is based on hormonally atypical individuals, such as individuals with congenital adrenal hypoplasia (XX individuals who make testosterone in the adrenal glands and complex androgen insensitivity syndrome (XY individuals who do not respond to testosterone), among whom there are higher levels of gender change later in life.

A study in 1995 also suggested that brain anatomy also has a role to play (Zhou, Hofman et al. 1995). This research group found that the size of the brain area essential for sexual behaviour (BSTc) is larger in men that in women, and that male-to-female transsexuals often have the same size BSTc as females. Subsequent genetic studies also revealed weak links with a number of genes and transsexuality (Hare, Bernard et al. 2009, Foreman, Hare et al. 2019). Family and twin studies are also used to determine heritability estimates of transsexuality, ranging from between 17-45%. Riki is concerned that these arguments are often weak and often not reproduced.

From left: Dr Sarah Stephenson (Queers in Science co-chair, vote of thanks), Professor Andrew Barron, Dr Riki Lane, Dr Sophia Frentz MRSV (MC, Chair of RSV Membership & Mentoring Committee)

As Joan Roughgarden writes in *Evolution's Rainbow*, there are more colours of gender than colours that we have names for. Evidence points to genetic heritability behind gender and sexual preference, but in the end, does it even matter? Andrew and Riki think not. We don't investigate the reasons as to why some people are short, some people are tall, and others are in between. We are different in many different

ways. Together, we are more colourful than any rainbow.

A livestream video of Andrew and Riki's presentations is available online from https://www.facebook.com/201662943328320/videos/771920039968056/ .

Further reading:

- Foreman, M., et al. (2019). "Genetic Link Between Gender Dysphoria and Sex Hormone Signaling." *J Clin Endocrinol Metab* 104(2): 390-396.

Context: There is a likely genetic component to gender dysphoria, but association study data have been equivocal. Objective: We explored the specific hypothesis that gender dysphoria in transgender women is associated with variants in sex hormone-signaling genes responsible for undermasculinisation and/or feminization. Design: Subject-control analysis included 380 transgender women and 344 control male subjects. Associations and interactions were investigated between functional variants in 12 sex hormone-signaling genes and gender dysphoria in transgender women. Setting: Patients were recruited from the Monash Gender Clinic, Monash Health, Melbourne, Australia, and the University of California, Los Angeles. Patients: Caucasian (non-Latino) transgender women were recruited who received a diagnosis of transsexualism [Diagnostic and Statistical Manual of Mental Disorders (DSM)-IV) or gender dysphoria (DSM-V)] pre- or postoperatively. Most were receiving hormone treatment at the time of recruitment. Main Outcome Measured: Genomic DNA was genotyped for repeat length polymorphisms or single nucleotide polymorphisms. Results: A significant association was identified between gender dysphoria and ERalpha, SRD5A2, and STS alleles, as well as ERalpha and SULT2A1 genotypes. Several allele combinations were also overrepresented in transgender women, most involving AR (namely, AR-ERbeta, AR-PGR, AR-COMT, CYP17-SRD5A2). Overrepresented alleles and genotypes are proposed to undermasculinise/feminize on the basis of their reported effects in other disease contexts. Conclusion: Gender dysphoria may have an oligogenic component, with several genes involved in sex hormone-signaling contributing.

- Hare, B. (2017). "Survival of the Friendliest: *Homo sapiens* Evolved via Selection for Prosociality." *Annu Rev Psychol* 68: 155-186.

The challenge of studying human cognitive evolution is identifying unique features of our intelligence while explaining the processes by which they arose. Comparisons with nonhuman apes point to our early-emerging cooperative-communicative abilities as crucial to the evolution of all forms of human cultural cognition, including language. The human self-domestication hypothesis proposes that these early-emerging social skills evolved when natural selection favored increased in-group prosociality over aggression in late human evolution. As a by-product of this selection, humans are predicted to show traits of the domestication syndrome observed in other domestic animals. In reviewing comparative, developmental, neurobiological, and paleoanthropological research, compelling evidence emerges for the predicted relationship between unique human mentalizing abilities, tolerance, and the domestication syndrome in humans. This synthesis includes a review of the first a priori test of the self-domestication hypothesis as well as predictions for future tests.

- Hare, L., et al. (2009). "Androgen receptor repeat length polymorphism associated with male-to-female transsexualism." *Biol Psychiatry* 65(1): 93-96.

BACKGROUND: There is a likely genetic component to transsexualism, and genes involved in sex steroidogenesis are good candidates. We explored the specific hypothesis that male-to-female transsexualism is associated with gene variants responsible for undermasculinisation and/or feminization. Specifically, we assessed the role of disease-associated repeat length polymorphisms in the androgen receptor (AR), estrogen receptor beta (ERbeta), and aromatase (CYP19) genes. METHODS: Subject-control analysis included 112 male-to-female transsexuals and 258 non-transsexual

males. Associations and interactions were investigated between CAG repeat length in the AR gene, CA repeat length in the ERbeta gene, and TTTA repeat length in the CYP19 gene and male-to-female transsexualism. RESULTS: A significant association was identified between transsexualism and the AR allele, with transsexuals having longer AR repeat lengths than non-transsexual male control subjects (p=.04). No associations for transsexualism were evident in repeat lengths for CYP19 or ERbeta genes. Individuals were then classified as short or long for each gene polymorphism on the basis of control median polymorphism lengths in order to further elucidate possible combined effects. No interaction associations between the three genes and transsexualism were identified. CONCLUSIONS: This study provides evidence that male gender identity might be partly mediated through the androgen receptor.

- Sanders, A. R., et al. (2017). "Genome-Wide Association Study of Male Sexual Orientation." *Sci Rep* 7(1): 16950.

Family and twin studies suggest that genes play a role in male sexual orientation. We conducted a genome-wide association study (GWAS) of male sexual orientation on a primarily European ancestry sample of 1,077 homosexual men and 1,231 heterosexual men using Affymetrix single nucleotide polymorphism (SNP) arrays. We identified several SNPs with p < 10(-5), including regions of multiple supporting SNPs on chromosomes 13 (minimum p = 7.5 x 10(-7)) and 14 (p = 4.7 x 10(-7)). The genes nearest to these peaks have functions plausibly relevant to the development of sexual orientation. On chromosome 13, SLITRK6 is a neurodevelopmental gene mostly expressed in the diencephalon, which contains a region previously reported as differing in size in men by sexual orientation. On chromosome 14, TSHR genetic variants in intron 1 could conceivably help explain past findings relating familial atypical thyroid function and male homosexuality. Furthermore, skewed X chromosome inactivation has been found in the thyroid condition, Graves' disease, as well as in mothers of homosexual men. On pericentromeric chromosome 8 within our previously reported linkage peak, we found support (p = 4.1 x 10(-3)) for a SNP association previously reported (rs77013977, p = 7.1 x 10(-8)), with the combined analysis yielding p = 6.7 x 10(-9), i.e., a genome-wide significant association.

- Zhou, J. N., et al. (1995). "A sex difference in the human brain and its relation to transsexuality." *Nature* 378(6552): 68-70.

Transsexuals have the strong feeling, often from childhood onwards, of having been born the wrong sex. The possible psychogenic or biological aetiology of transsexuality has been the subject of debate for many years. Here we show that the volume of the central subdivision of the bed nucleus of the stria terminals (BSTc), a brain area that is essential for sexual behaviour, is larger in men than in women. A female-sized BSTc was found in male-to-female transsexuals. The size of the BSTc was not influenced by sex hormones in adulthood and was independent of sexual orientation. Our study is the first to show a female brain structure in genetically male transsexuals and supports the hypothesis that gender identity develops as a result of an interaction between the developing brain and sex hormones.

Demystifying the IPCC

The Penelope Whetton Memorial Lecture

by Catriona Nguyen-Robertson MRSV

*This article follows a joint presentation on 6 February, 2020 by geoscience educator **Dr James Driscoll MRSV** from Monash University and climate scientist **Dr Chloe Mackallah** from CSIRO to the Royal Society of Victoria.*

The Penelope Whetton Memorial Lecture honoured the scientific memory of Penny

(pictured below, left), a distinguished Australian climatologist and expert in climate change projections. She was a Lead Author for the Fourth Assessment Report of the UN Intergovernmental Panel on Climate Change (IPCC), which was awarded the Nobel Peace Prize in 2007. It is only fitting that, for this lecture, the presenters demystified the IPCC and debunked a few climate change myths.

Penny was a valued member of the Royal Society of Victoria and a trans woman who underwent gender affirmation. Associate Professor **Deanne Fisher** (Swinburne University, pictured right) spoke on behalf of the Queers in Science Organising Committee; she shared that being trans-gender is 'scary' and that being an academic as well adds 'an extra twist'. She struggled to find a senior level person to look up to until she found Penny. Somehow, Penny being herself made it easier for Deanne to be herself.

* * *

The Earth receives its warmth from the Sun. Energy from the Sun reaches the Earth's atmosphere, it is absorbed by land and oceans. As the land and ocean absorb radiation and heat up, they release heat in the form of infrared (IR) thermal radiation, which passes out of the atmosphere into space. Some of it is trapped by greenhouse gasses. These gasses allow the sun's strong radiation to penetrate through the atmosphere to Earth, but weaker IR radiation has difficultly in passing back out through the barrier.

The presence of greenhouse gases in the atmosphere is not a bad thing; the average surface temperature of our planet it 15°C but without them it would be -18°C. The problem lies in the rapidly accumulating amount of anthropogenic greenhouse gasses that we are producing.

Humans have emitted two trillion tonnes of carbon dioxide between 1750-2011, and the rate at which we are releasing it is increasing (from 27 billion tonnes in 1970 to 49 billion tonnes in 2011).

Dr Chloe Mackallah (CSIRO, Climate Model Development Division, pictured above), read directly from the IPCC's Fifth Assessment Report that '[the effects of anthropogenic greenhouse gas emissions] are extremely likely to have been the dominant cause of the observed warming since the mid-20th century.'

'The IPCC has been saying the same thing since the 1990s, but no one is listening,' says Chloe. The IPCC warns of risks to food production and security, water availability, species extinction, biodiversity reduction, coastal erosion, floods and droughts, negative impacts on human health, and population displacement.

Dr James Driscoll (Monash University, Faculty of Science, pictured below with friend) is passionate about science communication and stresses its importance in the face of climate change. As someone who loves volcanoes, he was not convinced when politicians claimed that volcano eruptions release gases that are responsible for the current warming of the planet. In fact, he states, it is the opposite: large volcanic eruptions can result in global cooling events, for example causing a three-year winter after the 1815 eruption of Mount Tambora. While

volcanoes release 300-600 million tonnes of carbon dioxide per year, fossil fuel emissions were at 49 billion tonnes as of 2011 – volcanoes are not the 'smoking gun.' Myth debunked!

Jim is also concerned about the knack some people have developed of cherry-picking data to support a desired conclusion when it comes discussing climate change. While people may say that they are experiencing the coldest temperatures ever in a city and that therefore global warming isn't real, they are failing to see the bigger picture. When looking at global weather maps, it may be cold in one particular area, but the world is, on average, warmer.

The IPCC aims to understand the Earth's response to forcing and understanding climate variability and future scenarios. It does not conduct its own research or run models, but rather, provides a meta-analysis of the work of thousands of researchers across the globe to provide a scientific basis for governments to develop climate-related policies.

Chloe was frank: 'climate projection models show scary warming.' CSIRO has integrated a number of related climate models from universities, CSIRO and the Bureau of Meteorology to produce the Australian Community Climate and Earth System Simulator (ACCESS). The goal of the Paris Agreement is to limit the global temperature increase to 2°C, but even in the lowest emission scenario, if all countries commit to net zero emissions, we will still barely make it according to ACCESS's simulations. ACCESS predicts an increase in temperature of 6°C by 2094 and that the Arctic may be ice-free in the summer of 2050.

Climate change is something that personally affects us and the weather we experience. Heat waves will become more frequent and last longer. 'Scientific evidence unequivocally links human-caused climate change to increasing risk of frequent and severe bushfires in the Australian landscape,' says Jim. 'It's only going to get worse without changing our emissions'.

From left: Dr Sophia Frentz (RSV Membership & Mentoring Chair), Dr Chloe Mackallah, Dr James Driscoll MRSV, A/Professor Deanne Fisher (Queers in Science Committee Member)

Importantly, we can still make a difference. There are many measures that can be implemented to help address climate change, but no single option by itself is sufficient. Effective implementation depends on policies and cooperation at all scales. Jim and Chloe call on us to spread the word on made-made climate change so that we promote actions that counteract such change.

A livestream video of James' and Chloe's presentations is available online from https://www.facebook.com/201662943328320/videos/412741616188167/.

Videos of RSV Lectures and Events

Recent Transactions as of March 2020

*Livestream video recordings of our lectures and presentations are streamed live via the RSV's **Facebook** site and archived in our "videos " section on conclusion. A selection of playlists are displayed below – these and others can be accessed from* https://www.facebook.com/pg/royalsocietyvictoria/videos/ .

2020 RSV Lectures · 3

Livestream footage of lectures held at the RSV during 2020.

Climate Change in Australia and Demystifying the IPCC

3 weeks ago · 677 views

Queers in Science Lecture Series Wrap-up (Feb 2020)

3 weeks ago · 264 views

The Biology of Sexuality and Gender

4 weeks ago · 527 views

National Science Week

4 videos · Updated 3 seconds ago

Highlights from events during National Science Week

Extrasensory - see, feel, hear, touch, taste, more!

432 views · 30 September 2019

Science at the Extreme - National Science Week Launch 2019

222 views · 6 December 2019

National Science Week Community Briefing - underway

386 views · 18 March 2019

The Science of the Regional Forest Agreements

11 videos · Updated 14 seconds ago

The Royal Society of Victoria and the Department of Environment, Land, Water & Planning are partnering to deliver this series of talks concerning the... See more

First session: the Contribution of Forests to Global Carbon Cycles. ...

1.3K views · 24 September 2019

Second session: the Contribution of Forests to Global Carbon Cycles. ...

273 views · 24 September 2019

The Conservation of Water & Soil Resources: Rne Van der Sant,...

139 views · 25 July 2019

YouTube Channel

High quality digests and long-form videos of recent RSV lectures are available from our YouTube channel - http://tiny.cc/kx5q7y will take you to the list below.

Modernisation of the Regional Forest Agreements

The Royal Society of Victoria and the Department of Environment, Land, Water & Planning (DELWP) are partnering to deliver this series of talks concerning the science underpinning the modernisation of Victoria's Regional Forest Agreements, addressing each of the criteria listed in the latest State of the Forests report, released in 2019 by the Commissioner for Environmental Sustainability (https://www.ces.vic.gov.au/articles/scientific-report-card-victoria%E2%80%99s-forests). High quality video of proceedings has been produced by DELWP and are available from their Future Forests site at https://www2.delwp.vic.gov.au/futureforests/forest-values-assessment/public-lecture-series - footage currently online incorporates all five of the public lectures convened thus far.

Call for Applications

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.

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. We also gratefully acknowledge the support of Max and Margaret Richards across all categories.

2019 finalists with RSV officers

- 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 2020 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 2020 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 2020 Prize applicants. Student membership for all eligible Prize applicants will be free of charge for the remainder of 2020.

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 **Wednesday, 19th August 2020** 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 and supporters 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 through following the process at https://rsv.org.au/awards-and-prizes/young-scientist-research-prizes/

Support the Royal Society of Victoria

We are an independent, non-government organisation that relies on membership subscriptions, grants and private philanthropy to fulfil our objectives for community science engagement and literacy.

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

Online: we gratefully accept contributions 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 gratefully accept donations at the Society's office in cash, cheque/money order or via credit card.

Donation Form

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