



The Royal Society OF VICTORIA

Promoting science since 1854

PATRON: The Hon Linda Dessau AC
Governor of Victoria

PRESIDENT: Mr David Zerman

This Month's Events...

8th June: Panel Discussion & Forum
"Exoplanets and Life in Space"



*With Professor Rachel Webster (Chair),
Professor Alan Duffy, Dr Katie Mack, Dr
Morgan Saletta and Ms Upulie Divisekera*



22nd June: A W Howitt Lecture with Dr Andrew Tomkins
"Meteorites & Cosmic Dust: Insights to the Early Solar System & Earth"
Joint meeting with the **Geological Society of Australia (Victoria Division)**

July Advance Notice:



**13th July: Professor
Gordon Wallace AO**
*"3D Bioprinting – Printing
Parts for Bodies"*



**27th July: Professor Lynne
Selwood & Emeritus Professor James
Warren (lunchtime lecture)**
"Ripping Yarns – Two Lives in Science"

June 2017 Newsletter

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rsv.org.au



June Meetings

PANEL DISCUSSION: EXOPLANETS & LIFE IN SPACE



Thursday, 8th June 2017 at 7:00pm.



Chair: Professor Rachel Webster
Astrophysicist, School of Physics, The University of Melbourne

What's out there? How do we get there?

Can science take us to space, and to the stars? What forms might life take in other environments, with other branches of evolution to unfold? If life is found elsewhere, is sentient life a part of the picture, and what might that mean for a space-faring human species? Join us to explore the near universe and discuss the possibilities!

Panellist: Ms Upulie Divisekera

Coordinator of @realscientists

Molecular Biologist, Faculty of Engineering, Monash University



Are we alone in the universe? Is there other life out there? Can we travel to other planets in our Solar Systems, and cross the galaxy? For the first time in history, we can detect, even photograph other planets. We can interpret their composition, size, orbits. We've discovered moons in our own Solar System with conditions capable of hosting life as we know it. But finding life in the universe may not be as straightforward as we think, and we might have to reconfigure our definition of life. Travelling into space to find life and to explore the galaxy might also require more imaginative and long term thinking. Either way, humans will be able to innovate new ways to see life and to travel in space.

Ms **Upulie Divisekera** is a molecular biologist, science communicator and writer based in Melbourne. Over her research career, Upulie has worked in cancer research, developmental biology and is currently involved with nanotechnology research. She co-founded the highly successful science outreach program, *Real Scientists*, and communicates science through writing, performance and radio. Upulie is interested in the intersection of science and culture and works with the Wheeler Centre to bring novel science programming to Melbourne.



Panellist: Dr Katie Mack

Theoretical Astrophysicist, DECRA Fellow
School of Physics, The University of Melbourne

Rather than being a purely philosophical question, "Are we alone in the Universe?" is a matter of active, rigorous, scientific research. With new technologies and observational clues, we're closer than ever before to being able to find and characterise extraterrestrial

June Meetings

life. Where might it be, and how are we looking for it? What are the chances that aliens really are out there? We'll discuss these questions and the status of our search for life both within our Solar System and throughout the Galaxy.

Dr **Katherine (Katie) Mack** is a theoretical astrophysicist. Her work focuses on finding new ways to learn about the early universe and fundamental physics using astronomical observations, probing the building blocks of nature by examining the cosmos on the largest scales. Throughout her career as a researcher at Caltech, Princeton, Cambridge, and now Melbourne University, she has studied dark matter, black holes, cosmic strings, and the formation of the first galaxies in the Universe. Katie is also an active online science communicator and is passionate about science outreach. As a science writer, she has been published by Slate, Sky & Telescope, Time.com, the Economist tech blog "Babbage", and other popular publications.

Panellist: Associate Professor Alan Duffy

*Science Communicator & Astrophysicist
Centre for Astrophysics & Supercomputing, Swinburne University*



Our exploration of the Solar System is pushing the limits of communication, involving giant radio dishes across the world as part of NASA's Deep Space Network just to discern the whisper of radio signal against the background of space and our own noisy planet. Yet fundamental limits to transmitting signal no faster than the speed of light force us to do evermore of the decision making on board our craft rather than wait for 'mission control' on Earth. The near future of space exploration will see a revolution in smart probes, intelligently guiding themselves in their mission. The far future may yet see us explore even further, to the stars themselves.

Let's explore the challenges and opportunities awaiting us in space and why Hal from *2001: A Space Odyssey* may in fact be your crew mate when we do leave Earth for the inner Solar System!

Swinburne astronomer Associate Professor **Alan Duffy** works on dark matter, dark energy, galaxy formation and cosmology as well as explaining science nationally on TV. He is an experienced public speaker, science communicator and science expert in Melbourne.



Panellist: Dr Morgan Saletta

*Anthropologist of Science & Technology
School of Historical & Philosophical Studies, The University of Melbourne*

Surrounding Earth is a cold, dark and deadly sea- vast beyond imagination. But you wouldn't know it from the local weather report- sunny with a chance of rain. Thanks to Earth's magnetic field and atmosphere, we carry on our daily lives without much thought to the fragile life support system of our Spaceship Earth.

If we're going to live out there, in near Earth orbit, on the moon, Mars, the asteroid belt, or anywhere else in the vast expanse of the solar system – we're going to need to take our life support system and radiation shields with us. We'll need food, shelter, clothing, tools and fuel for transport. What we can't take with us, we're going to have to find, extract, process, build and grow. Let's explore some of the emerging technologies, from inflatable habitats and 3D printing to biophilic design, that we'll use to colonize the final frontier.

Dr **Morgan Saletta's** areas of expertise include science and technology policy, complex systems, business history and strategy, innovation and entrepreneurship. Current research interests include the commercialisation of space, new business models, energy, the circular and sharing economies and public, private and hybrid strategies for a sustainable, resilient future in the Anthropocene. He completed his PhD in Science and Technology Studies and the History and Philosophy of Science at the University of Melbourne.

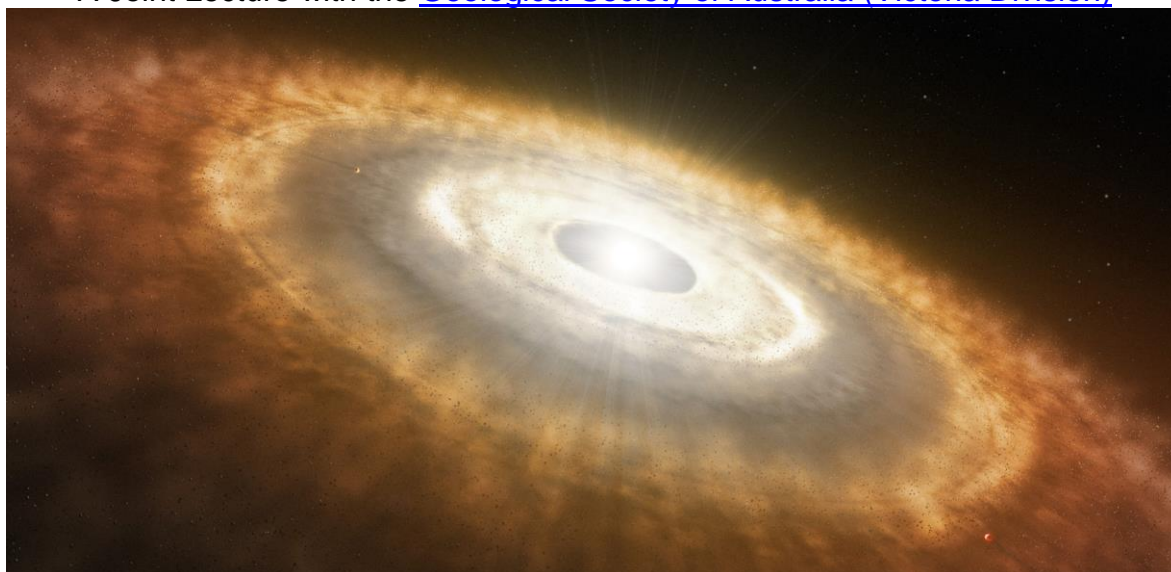


Food + Drink + Company available from 6:15 at members' & guests rates. **A free public lecture from 7pm, bookings essential! Register online now at <https://rsv.org.au/events/exoplanets-life-space/>**, call or email the RSV office to secure your place: 9663 5259, rsv@rsv.org.au.

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

The 2017 A W Howitt Lecture

A Joint Lecture with the [Geological Society of Australia \(Victoria Division\)](#)



Thursday, 22nd June 2017 at 7:00pm.

Speaker: Associate Professor Andy Tomkins
School of Earth, Atmosphere & Environment, Monash University

The only place in the Solar System that mankind has visited, and brought back rock-sized chunks, is the Moon, at the cost of billions of dollars. Meteorites, on the other hand, have provided us with rocks from about 110 asteroids, as well as Mars and possibly even Mercury. And, tiny cosmic dust particles, which end up on Earth as micrometeorites, come from comets and debris left over from collisions between asteroids.

Monash University geoscientists have been scouring the Nullarbor Plain for meteorites, recovering over 200 in the last 8 years. Because nearly all meteorites formed in the first 5 million years of our Solar System's history, we can use them to investigate how the asteroids formed and evolved 4.56 billion years ago. We can use meteorites to investigate the ages of volcanic eruptions on Mars, and even glean clues into changes in Martian atmospheric chemistry over time. Micrometeorites are hundreds of times more abundant than meteorites, and can even be found on the roof of your house. They can consequently be found relatively easily in ancient sedimentary rocks, and we can use these fossil micrometeorites to investigate the chemistry of the early Earth's upper atmosphere.

In this talk, A/Prof. Tomkins will show how he and his students find meteorites on the Nullarbor Plain, and discuss how these and others from around the world are being used to study the asteroids and Mars. He will also present the results of some exciting break-through research on the world's oldest fossil micrometeorites and what they mean for our understanding of Earth's atmosphere 2.7 billion years ago.

About the speaker:



A/Prof Andy Tomkins is a geoscientist who applies the principles of metamorphic petrology, structural geology and igneous petrology to his work to make unique contributions to the fields of economic geology, meteoritics and planetary science. He worked in the minerals industry for three years on finishing his undergraduate geology degree in Sydney before undertaking a PhD in economic geology with Dr John Mavrogenes at the Australian National University. Following a postdoctoral fellowship in Canada and a research fellowship at Monash University in Melbourne, Andy took on a continuing role at Monash teaching one of the largest economic geology classes in Australia, supervising his own PhD students and researching economic geology, meteorites and planetary science.

Eventbrite

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

From the President

There IS such a thing as a free morning tea!



As a community-based, not-for-profit organisation the Society has been promoting science since its beginnings in 1854. Since those days, methods and styles of communication have changed beyond the imagination of our earliest members and presenters. To enable the wider Victorian community (and those interstate and overseas) to see our very informative fortnightly lectures and discussions, the Council is planning a major audio visual upgrade of the Ellery Theatre so we can broadcast our presentations in an engaging format to the broader community of interest after they have been delivered.

That's where we are hoping you can support us. I will shortly be writing to each member seeking your financial support as we arrange funding for this upgrade. We are hoping to raise \$60,000 from our Members with the additional \$180,000 support from philanthropic Trusts and Foundations, Corporate supporters and other people in the community.

I hope you can support us when you receive my letter about this appeal to take our speakers' presentations to the wider Victorian community.



This year we embark on an ambitious project to upgrade our lecture theatre facilities with the requisite audio-visual and networking capabilities to bring some of our wonderful events to the wider community through a dedicated YouTube channel and network services to connect our theatre and members with regional facilities and audiences.

If you haven't visited recently, or would like to personally reacquaint yourself with our facilities and the historic items on display, or browse through items in the heritage Cudmore Library, you are more than welcome to visit (bring your friends) to have a tour around our spectacular building on **Thursdays between 12.30 and 1.30pm**. If you'd

like to bring a group of people to visit, please contact our office on 9663 5259 to make special arrangements, as our facilities are frequently booked by venue hire clients and may be otherwise occupied.

I always look forward to meeting Members and visitors at our various functions, but sometimes there's not enough time for a good discussion so I'm pleased to invite members who'd like to join me for a chat and morning tea on **Wednesday 21st June at 10.30am**. To help with catering could you please book on this link: <https://rsv.org.au/events/morning-tea/>

If you'd like to contact me please phone me on 0418 346 999 or, if you'd prefer, please email me at davidzerman@gmail.com so we can have a chat.

I look forward to seeing you soon at one of our exceptionally interesting presentations, which are detailed earlier in this newsletter.

Science Prizes, Awards & Fellowships

The Phillip Law Postdoctoral Award for the Physical Sciences



Applications are invited for the 2017 Phillip Law Award, given for outstanding work in the physical sciences by a postdoctoral researcher within seven years of being awarded their doctorate from a Victorian university.

Eligibility, guidelines and application procedures are all available from <https://rsv.org.au/awards-and-prizes/dr-phillip-law-ac-post-doctoral-award/>.

Applicants should nominate themselves. Submissions close at 5pm on **30 June 2017** – we welcome your interest.

RSV Medal for Excellence in Scientific Research

Nominations are invited for the Royal Society of Victoria's prestigious **Medal for Excellence in Scientific Research 2017** in **Category I: Biological Sciences (non-human)**.

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

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



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

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

Nominations for RSV Membership

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

Dr **Paul Charles Dominic LEOPARDI**, Scientific Application Analyst

Mr **James NEAVE**, Year 12 Student

Mr **Matthew John COLEMAN**, Student

Ms **Sophie OAKES**, Student

Ms **Rose HISCOCK**, Science Gallery Director

Mrs **Tessa Lyn BARRETT**, Retired

Mr **Hu GUOPING**, PhD Student

Mr **Bryant Samuel GAGLIARDI**, PhD Student

Miss **Shravanti Sudhendra JOSHI**, PhD Student

Mr **Yann ROBIOU DU PONT**, PhD Student

Miss **Neha RATHI**, PhD Student

Ms **Litty Varghese THEKKEKARA**, PhD Student

Mr **Perran Adam ROSS**, PhD Student

Miss **Vhairi MACKINTOSH**, PhD Student

Mr **Nicolas Esteban MOLNAR**, PhD Student

Unless Members request a ballot, they will be considered for election by Council and if elected, will be announced at the Ordinary Meeting of the Royal Society of Victoria to be held on 13th July.

Recently elected members who have not yet signed the Society's membership book are invited to attend the 8th 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.

May Field Trip

Exploring the Hidden Collections of the Melbourne Museum

Thursday, 18 May 2017 @ 2.00pm



Dermot Henry, Head of Sciences introduces Museum collection managers and curators: Jo Taylor, Tim Ziegler and Ken Walker.

We felt so privileged to receive a wonderful tour of some of Melbourne Museum's vast science collections, pretty much just "the tip of the iceberg," with generous insights from helpful staff. Head of Science Dermot Henry, Collections Managers Jo Taylor and Tim Ziegler and Curator Ken Walker treated us to a fascinating insight to the insect, palaeontology and marine invertebrate collections that drive globally significant research. There was much that couldn't be photographed due to its unfolding research significance, but suffice to say these scientists are doing game changing work thanks to the digitisation of their artefacts for collaboration with the wider community of researchers and valuable interactions with citizen scientists out in the field.



The stunning, iridescent wings of these South American butterflies change colour as the light hits different angles, creating a "flashing" effect when in flight that confounds predators.



Tim Ziegler with the skull of an ancestral baleen whale (with teeth!), reconstructed from fossil fragments CT scanned at St Vincent's Hospital, pieced together digitally, then printed! The vertebrate palaeontology lab and stores are filled with incredible specimens of Australian megafauna; marsupial rhinos, ichthyosaurs, many too new to the research collections to photograph.



The remarkable Ken Walker demonstrates a \$100,000 microscope that has been used to photograph and record thousands of new species of minuscule animals, correcting the typically poor depth of field by using multiple images compiled through specialised software to return exquisitely rendered details in a perfectly-focussed composite image. Ken's work encompasses many significant

projects and programs, however he particularly emphasised the vital importance of citizen science to the Museum's efforts in discovering, identifying and classifying new species.

Enormous thanks to Dermot and colleagues for being so generous with their time and insights, and to our friends from the Young Scientists of Australia (pictured below), Melbourne Chapter for joining our behind-the-scenes romp through the collections. To be repeated in 2018! So much more to discover.



Women in science? No worries! Switched-on members of YSA Melbourne in the mix.

The Challenges of a Changing World: Conservation & Park Management

Dr Mark Norman, Parks Victoria



Productive partnerships between Parks Victoria and potentially high-impact users of national parks and reserves ensures the destruction of high value ecologies and species is minimised. Motorists, hunters, fishers and other recreational users of reserves all have productive roles to play in conservation, and largely self-regulate aberrant behaviours within their own formal and informal groups.



From left, RSV President David Zerman, Dr Mark Norman and IPP Dr Bill Birch (vote of thanks).

Huge thanks to **Dr Mark Norman**, Chief Conservation Scientist with Parks Victoria, for a fantastic presentation last night on the particular challenges of managing the conservation needs of State's many parks, reserves and sanctuaries.

With all the immediate and legacy impacts on terrestrial and marine ecologies from human activity since European settlement,

there was little time to dwell on the anticipated impacts of a warming climate. It was, however, a compelling insight to the complex social and political tapestry that governs the work of Mark and his team, balancing the competing interests of native plants and animals and the many different groups of humans who interact with these environments as tourists, walkers, campers, hunters, four wheel drive tourists, motor sport enthusiasts, developers, the Country Fire Authority, Indigenous custodians and land care volunteers.



Feral species do enormous damage to Victoria's native species and ecology, an enduring legacy of both deliberate and passive introduction of European plants and animals to Victoria in the 19th century. Parks Victoria has to contend with the enduring connection Victorians have with European species in attempting to control numbers and minimise destructive impacts - as political as it is scientific, prone to polemics in debate and far from easy to achieve accord within communities of interest.

With so many people, plants and animals to keep in the picture, and ever-shifting cultural attitudes towards human interactions with wilderness and nature, Parks Victoria have their hands very full. Members and friends in attendance were adamant through question time that the work of conservation scientists, rangers, Indigenous custodians and volunteers desperately require an injection of funds to ensure Victoria's incredible diversity of wilderness places and native species are understood, valued, managed and protected by all Victorians as the iconic treasures they are.

Valete

The Council of the Royal Society of Victoria records with sadness the passing of two long-standing RSV members:

Mr Jock Campbell Wallis OAM

Of Seymour, passed away on 28 February 2017.



Jock was a fourth generation Seymour farmer "passionate about conservation and community," an agent for change in traditional farming practices and the impact of agriculture on the environment. He was a member of the Sciences Club, which merged with the Royal Society of Victoria in 1990.

Full obituary:

<http://www.smh.com.au/comment/obituaries/visionary-farmer-passionate-about-conservation-and-community-20170510-gw1amy.html>

Mr Duke Paine

Of Scotchman's Creek, Mt Waverley, passed away on 15 April 2017.

Duke joined the Society in 1961 and was a member of some 56 years!

We extend our sincere condolences to the families, friends and colleagues of Jock and Duke, and record our gratitude to our erstwhile members for their lifetime of dedication to promoting the sciences in Victoria.