

11 April 2019

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From the Dean

NEWSLETTER

While Barbara is on leave this month I'm acting Executive Dean.

It has been a busy few weeks for the Faculty with the release of the 2018 Excellence in Research for Australia ratings, the NSW Government backing the Sydney Quantum Academy, FIRST Australia hitting a five year record for hosting robotics championships, as well as new discoveries in our research areas and new opportunities for those looking to work with us.

The Faculty has performed exceedingly well in the 2018 Excellence in Research for Australia (ERA) ratings and 2018 Engagement and Impact Assessment (EI) results, released last month. In ERA, at the 2-digit code level all of our research areas were rated as above or well above world standard. In the inaugural EI results over 80 per cent of the ratings our research areas received for engagement, impact and approach to impact were medium or high. Well done to all our academics and research support staff, and especially to David Coutts our Associate Dean, Research.

The NSW Government's backing for the Sydney Quantum Academy is an exciting announcement and promises to cement Sydney's place as the leading global city for quantum technology. I look forward to working with our colleagues at the University of Sydney, UNSW Sydney and the University of Technology Sydney as we progress this initiative further.

Last month, FIRST Australia celebrated five years of hosting international, qualifying regional events in Australia. Our Macquarie alumni weren't far from the action, picking up two awards at the Southern Cross Regional.

In research news from the Faculty we look at the past and future of 'blue carbon', go time travelling through small bubbles of oil and gas, and ask if the eye could hold the promise of early detection of Alzheimer's disease. And we celebrate accolades from across the Faculty in Congratulations corner.

Read on for information about the three new staff who have joined the Faculty in the last month, the 10 vacancies we're currently advertising, and the details of four events you may be interested in.

If you want to know more about what's happening across the Faculty, follow our Faculty Twitter account [@MQSciEng](#) and Barbara's personal account [@BarbaraMesserle](#). If you've got news to

share, please tweet about it and include our Faculty handle so we can see it and retweet. If you're not on Twitter, then email us at fse.execdean@mq.edu.au and we'll share the news.

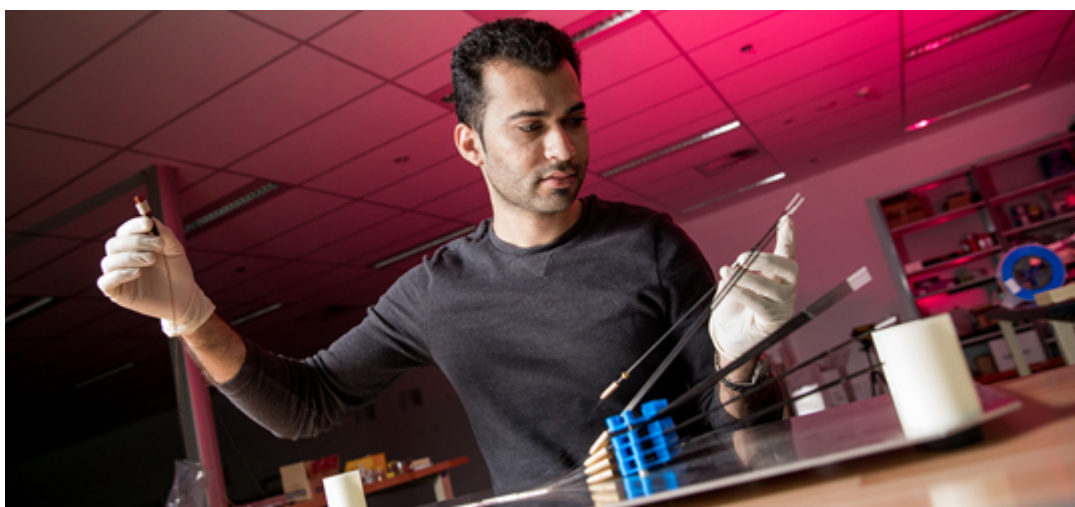
Regards,

Bernard

In this bulletin

- [Faculty excels with excellent ERA and EI results](#)
 - [Universities welcome NSW Government backing for Sydney Quantum Academy](#)
 - [Accolades for Macquarie alumni at FIRST Robotics Competition](#)
 - [The past and future of 'blue carbon'](#)
 - [Time travelling through small bubbles of oil and gas](#)
 - [Could the eye be the window to Alzheimer's?](#)
 - [Congratulations corner](#)
 - [Research in tweets](#)
 - [Faculty news and notices](#)
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Faculty excels with excellent ERA and EI results



Our Faculty has performed exceedingly well in the 2018 Excellence in Research for Australia (ERA) ratings and 2018 Engagement and Impact Assessment (EI) results, released by the Australian Research Council last month.

In ERA, at the 2-digit code level all our research areas were rated as above or well above world standard.

This is a tremendous outcome for our Faculty! Well done to all our academics and research support staff, and especially to David Coutts our Associate Dean, Research.

Our researchers in Biological Sciences, Physical Sciences, Environmental Sciences and Agricultural & Veterinary Sciences received the maximum ERA 5 rating, meaning their research is rated as well

above world standard. Environmental Sciences and Physical Sciences have maintained this rating since ERA 2010.

Mathematical Sciences, Chemical Sciences, Earth Sciences, Information and Computing Sciences and Engineering received an ERA 4 rating meaning their research is rated above world standard.

I am particularly pleased that Engineering and Computing which have been the focus of long-term strategic investment, performed so well.

At the 4-digit level three areas we submitted for the first time— Macromolecular & Materials Chemistry, Materials Engineering, and Horticultural Production—were all rated as well above world standard.

In the inaugural EI results over 80 per cent of the ratings our research areas received for engagement, impact and approach to impact were medium or high.

Environmental Sciences received a high rating for engagement, Earth Sciences received high ratings for impact and approach to impact, and Agricultural & Veterinary Sciences received high ratings for all three.

Our impact studies that received a high rating included building a disease-resilient and more diverse oyster industry; TerraneChron delivers a powerful tool to help discover new mineral deposits; and cross-cultural biodiversity surveys in eastern Arnhem Land.

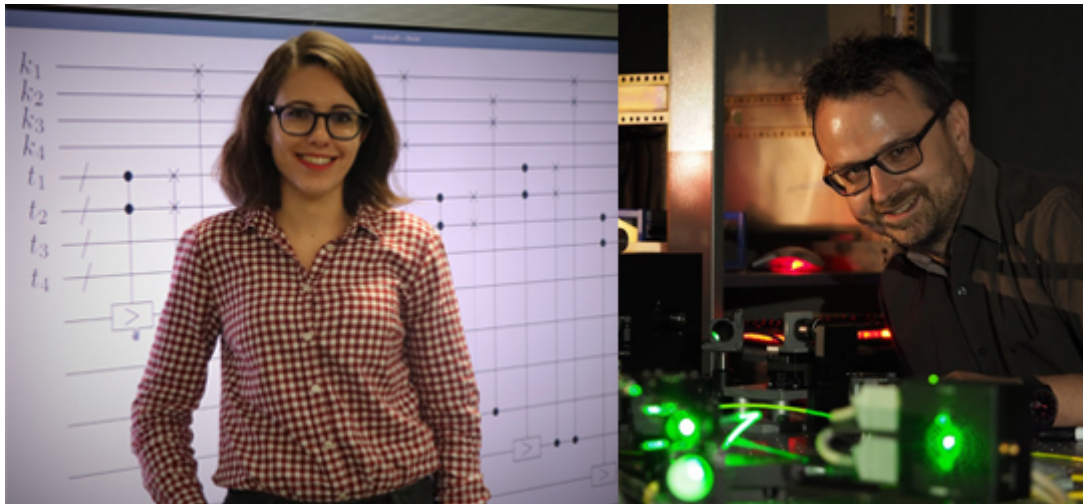
Overall, these results show that our approach leads to world-leading research that is having a real impact.

“Macquarie’s strategic investment in, and focus on, quality and innovation has strengthened established research areas and launched emerging research areas that enable us to undertake this world-leading research with world-changing impact for the betterment of humankind, our societies, economies, and the environment,” says DVCR Sakkie Pretorius.

“Macquarie’s many research strengths – from biological, environmental and clinical sciences, philosophy, physics, agriculture, applied ethics, neuroscience, linguistics, pure mathematics, computing, finance and engineering to genetics, optical physics, environmental management and ecology – will do much to address some of the most pressing global issues including food security, climate change, hearing loss, chronic diseases and medical ethics.”

Find out more about our [ERA ratings](#) and [EI results](#).

Universities welcome NSW Government backing for Sydney Quantum Academy



The NSW Government has announced support for the establishment of a new Sydney Quantum Academy with \$15.4 million in funding, bringing together four leading universities in NSW.

The Sydney Quantum Academy is the initiative of Macquarie University, UNSW Sydney, the University of Sydney and University of Technology Sydney.

It will help train the next generation of engineers and scientists in quantum computing, cementing Sydney's place as the leading global city for quantum technology and ensuring NSW is a world centre for jobs in the emerging quantum economy.

The funding, combined with current university and future industry support, means the total investment in the Sydney Quantum Academy will be up to \$35 million.

"The Academy brands Sydney as a player in the new Quantum Economy emerging worldwide," says Physics and Astronomy's Thomas Volz.

"We are facing strong competition for global quantum talent and the academy will help to attract that talent—both for academia and for the emerging quantum technology sector.

"It will help create an ecosystem that helps us bring our ideas and inventions to the market, and helps start-ups in the quantum arena."

Mária Kieferová is a PhD student at Macquarie University, developing algorithms that will be needed to solve real-world problems on future quantum devices.

"I hope that the Academy will give rise to quantum companies in NSW that will offer industry research positions as an alternative to an academic career," she says.

"My research attracts a lot of commercial interest overseas because of its application to hard computational problems in the industry. Unfortunately, commercial quantum algorithms research in NSW currently is minimal.

"The Academy can attract overseas companies to branch out to Australia, as well as support a start-up environment.

“I hope that Sydney can become a hub for developing quantum technologies in both the academic and the commercial sectors.”

[Find out more](#)

Accolades for Macquarie alumni at FIRST Robotics Competition



Students from all over Australia competed with students from 10 countries at Sydney’s Olympic Park Quaycentre for the 2019 Southern Cross and South Pacific *FIRST* Robotics Competition Regionals last month.

And Macquarie alumni weren’t far from the action, picking up two awards at the Southern Cross Regional.

Outstanding mentor Sarah Heimlich won the Woodies Flowers Finalist Award, and Melinda Blake won the Outstanding Volunteer Award.

The *FIRST* Robotics Competition charges students with designing, building and programming large robots and is celebrating five years hosting an international, qualifying regional event in Australia.

This year’s competition focused on the outer limits of the universe in *DESTINATION: DEEP SPACE* in which each team’s robot must work in an alliance on a remote planet to collect enough cargo pods to take with them on their spaceship before lift-off.

Director of *FIRST* Australia, Luan Heimlich, says the competition is about inspiring young people’s interest and participation in science and technology.

“The competition is about more than establishing a winning team, but rather aims to be a fun way for students to involve themselves in real world technologies. Thanks to the continued involvement of Macquarie University, as well as sponsors such as Google and Ford, students can also have continued access to their STEM interests through an entry program to university, or an internship or networking opportunity with one of our sponsors.

“Macquarie is proud to be involved to create a pathway for the next generation of STEM education and careers. The competition is all about teamwork and it inspires confidence and ambition in participating students, all while they have a great time building robots.”

[Find out more](#)

The past and future of ‘blue carbon’



Rising sea levels are allowing coastal wetlands to store more carbon, which may have implications for how we best manage them in the future, according to two new papers co-authored by Macquarie researchers.

The first paper, published in *Nature*, looked at how sea level change over the past few thousand years has influenced how blue-carbon—the carbon stored in wetlands, rivers, estuaries and oceans—is stored globally.

Coastal wetlands sequester the highest rates of atmospheric carbon dioxide of all natural ecosystems, say Environmental Sciences’ Jeff Kelleway and Neil Saintilan.

They found that as sea levels rise these rates increase further, meaning these wetlands could help mitigate some of the effects of climate change.

The second paper, published in *Scientific Reports*, looked at the carbon benefits of letting the sea back into impounded coastal floodplains.

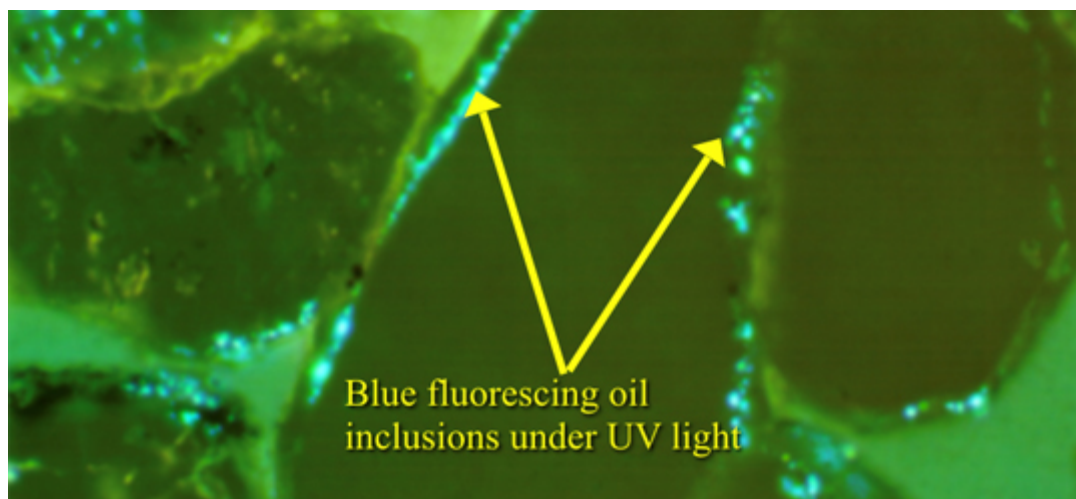
The paper found this led to reduced carbon dioxide emissions but not methane emissions, although this was also influenced by the wetland’s elevation and the rainfall it received.

The *Scientific Reports* paper was the last paper co-authored by our late colleague Grant Edwards, and his fellow authors dedicated it to his memory.

“This contribution would not have been possible without his scientific vision and technical proficiency,” they said.

[Find out more](#) Photo by [Katie Haenn](#).

Time travelling through small bubbles of oil and gas



Microscopic bubbles of oil and gas trapped in minerals, known as fluid inclusions, can provide us with critical information about what has happened in the geological past.

Earth and Planetary Sciences' Simon George is the world-leading researcher in petroleum fluid inclusions, and with Herbert Volk at BP has recently co-published a major review paper outlining different techniques for analysing these inclusions—a culmination of more than 20 years of research.

“By better understanding the composition and distribution of these tiny bubbles, we can reconstruct the past migration, or movement, of oil and gas in the layers of rock below the Earth’s surface,” explains Simon, “and better predict where more resources may be found.”

Many oil companies use the techniques Simon has developed to analyse these fluid inclusions when they’re exploring for new and commercially available oil and gas resources.

This allows them to be more targeted in their approach, saving both time and money.

The techniques they use to analyse these incredibly small volumes of fluid have progressed to such a point, says Simon, “where there is little that can be done to evaluate a live oil or gas sample that cannot be achieved for a fluid inclusion sample”.

[Read the review](#)

Could the eye be the window to Alzheimer's?



Elevated levels of amyloid beta, a protein associated with Alzheimer's, have been found in the eyes of animal models in the early stages of the disease.

The result was one finding from two recent comprehensive studies looking at the effects of amyloid beta in cell and mice models of Alzheimer's, conducted by the Australian Proteome Analysis Facility's (APAF) Scientific Director Mehdi Mirzaei and his team in collaboration with Vivek Gupta and other researchers from Macquarie's Faculty of Medicine and Health Sciences.

Alzheimer's disease affects an estimated 45 million people worldwide, and there is currently no simple diagnostic test to determine whether a person has the disease.

Recent research has suggested that Alzheimer's also affects your eyes, although the exact details of how it affects the eyes are unclear.

"These studies demonstrate for the first time that amyloid beta is elevated in the eyes, specifically photoreceptor cells in the retina, even in the early stages of the disease," says Mehdi.

Such changes in the eyes could be used as an early marker of Alzheimer's disease, he says.

The studies also provided insights into the molecular changes that occur in the retina as the amyloid beta accumulates.

"Such data can be used to better understand the mechanisms of Alzheimer's disease," says Mehdi, "and may highlight new targets for drug development, as well as better ways to diagnose and monitor the progression of the disease."

These studies are a step towards identifying changes in the retina that could lead to a specific Alzheimer's disease biomarker in humans.

Retinal screening holds the promise of being able to detect such markers more cheaply than brain imaging, and before the disease progresses to an advanced stage.

Read the papers: [Molecular Neurobiology paper](#); [Frontiers in Molecular Neuroscience paper](#)

Photo by [Marc Schulte](#).

Congratulations corner



Congratulations to Earth and Planetary Sciences' Dick Flood (pictured with DVCA Kevin Jameson), who was recently recognised for over 50 years of service to Macquarie University.

Dick says when he came to Macquarie in early 1968 [the university was a construction site](#).

"For me being an academic at Macquarie has been very enjoyable, in large part due to the kindness of the other staff and the niceness of the students," he says. "To all who have been so nice and helpful to me over the years I say thank you very much."

Mathematics and Statistics' Xuan Duong, Environmental Sciences' Paul Hesse, Earth and Planetary Sciences' Mark Lackie, Molecular Sciences' Danny Wong and the Faculty's Ken Yuen were all recognised for over 25 years of service.

Computing's Michael Sheng has been recognised as one of the Top 100 Most Influential Scholars in the Internet of Things research.

[AMiner named Michael the 24th most influential scholar in the world](#) for his research, which in particular looks at how to efficiently and effectively manage billions of things over the future World Wide Web.

Congratulations are also due to Computing's Jian Yang who has been elected to CORE's executive team. CORE, [the Computing Research and Education Association of Australasia](#), is an association of computer science university departments in Australian and New Zealand.

Jian is serving as the association's secretary and treasurer, the first time a Macquarie academic has been on the Australian and New Zealand peak body of computing's leadership team.

Peak national body, the Statistical Society of Australia, has awarded its [2019 President's Award for Leadership in Statistics to the Biostatistics Collaboration of Australia \(BCA\)](#).

The BCA is a national consortium of six universities currently led by Macquarie, and is the collaboration under which we deliver our Master of Biostatistics program. Mathematics and Statistics' Gillian Heller and Ian Marschner both serve on the consortium's steering committee, with Gillian the current chair.

"This is a wonderful honour and strong external endorsement of our Master of Biostatistics program," says Ian.

And congratulations to Earth and Planetary Sciences' Simon George who has led a Sydney consortium (involving Macquarie, the University of Sydney, CSIRO and SIMS) in a successful bid to host the annual [Australia-New Zealand International Ocean Discovery Program Consortium \(IODP-ANZIC\)](#) masterclass for 2019 and 2020.

The masterclass takes one to two of the best second year undergraduate students from each participating university in Australia and New Zealand and trains them for a week in marine geoscience techniques and objectives.

"This is a great outcome for teaching and research in marine geoscience at Macquarie University, as these are the best second year students of their cohorts, who will be exposed to our marine geoscience teaching and research," says Simon.

Research in tweets

We've been sharing snippets of our recently published research and Faculty members being mentioned in the media on Twitter.

Here are some recent highlights from [@MQSciEng](#).

Even if an artemisinin-binding protein is only present in minute amounts, "if its interaction with the drug is weak but specific, you'll eventually see it," says @MQMolSci's Peter Karuso QT @cenmag: [Researchers now have the first evidence](#) that a potent anti #malaria drug also directly targets a tumor-related protein.

"We have watched so many frogs around the world hop from existence. If we can prevent yet another of the world's frog species from blipping out, I would be ecstatic," [says @MQBiology's @SimonClulow](#)

RT @EcolSocAus: How can we better engage with #Indigenous knowledge, people and Country in "mainstream" Western #ecology? @EmilieEns from @MQSciEng [shares her tips in the #ESABulletin](#)

RT @sciencesarah: Surely commercial harvesting is a threat to the tropical reptiles that are collected and killed for their skins? Actually, no. [Banning exotic leather in fashion hurts snakes and crocodiles in the long run](#)

RT @Macquarie_Uni: Sharks aren't the mindless killing machines that scared everyone in the 1970's movie Jaws - they're smart, learn quickly and have feelings, says Prof @CulumBrown. [Read a sneak peak of the talk he'll deliver at @seamuseum_ in April](#)

RT @DoctaBlonde: Our latest paper - great multidisciplinary neuroscience collaboration with @MQMolSci @MQSciEng and @UniofAdelaide! @VickyAlexandrou @profsugar @prof_hutchinson @CNBPscience QT @CNBPscience: Latest #CNBP paper by lead author @DoctaBlonde based @Macquarie_Uni. [Visualizing #neuroinflammation with fluorescence and luminescent lanthanide-based in situ hybridization](#)

RT @MQBiology: A warning has been sounded that insects could disappear within a century. But #entomologist Dr Matthew Bulbert says we can all do something to help save them. [Find out how](#)

In an industry worth around \$25 billion per year in Australia, data sharing is fraught with risk. That's why Dali Kaafar from @OptusMQCSH is advocating for a more holistic approach that finds the right trade-off that makes the most of data, while guaranteeing individual privacy. QT @OptusMQCSH: 'Cover Story: In the rush to lead the world, Australia's data sharing frameworks are creating more risks' @which50. [Read more on what Prof Dali Kaafar, the Hub's Chief Scientist and expert in this field, has to say.](#)

Building instruments used for telescopes and doing research on the interstellar medium to study gas, metals and dust in galaxies—astronomer Tayyaba Zara from @AAOMacquarie was one of the 80 women part of the 2018 @HomewardBound16 initiative. QT @tzafar_astro: [Thanks to the morning show Jagoo Lahore to invite me and let me share my @HomewardBound16 experience](#)

Faculty bulletin

**New staff | Current vacancies | MQ Women in Engineering Leadership Summit | A g
land | University Bioquest is back | “Women of Mathematics: A Gallery of Portraits”**

Welcome to new Faculty staff

A warm welcome to all the new staff who have joined the Faculty in the last month.

Please join me in welcoming **Yixuan Liu** who joins AAO-MQ as Administration and Outreach Coordinator.

Mehmood Rashid joins Physics and Astronomy as a Laboratory Coordinator.

And **Paul Connor** joins Physics and Astronomy as a Scientific Officer.

Current vacancies

We're looking for a [Deputy Dean of Learning and Teaching](#) for our School of Engineering.

Engineering is also seeking a suitably qualified [Postdoctoral Research Fellow](#) to help build the profile of the School in audio signal processing and biomedical engineering—particularly related to hearing and hearing technologies, and cochlear implants.

The School is also looking for an enthusiastic and suitably qualified [Technical Officer](#) and an engaged and well organised [Administrative Assistant](#).

We're seeking an outstanding [Associate Professor or Professor](#) with the vision, capability and capacity to take on a leadership role in the discipline of Anatomy in the Department of Chiropractic.

[An experienced and innovative manager](#) is being sought to manage and support the operational implementation and maintenance of the PACE initiative for the Faculty.

Earth and Planetary Sciences is seeking an outstanding [high-pressure experimental scientist](#) to spearhead the development and exploitation of high-pressure experimental systems in our laboratory.

Mathematics and Statistics is looking for a [Postdoctoral Research Fellow \(Level A or B\)](#) who has a strong research interest and growing reputation in harmonic analysis and related fields.

Molecular Sciences is seeking a [Research Fellow in Natural Products Chemistry](#) to lead the natural products research activities of two industry-led CRC Projects (BioAustralis: Towards the Future and The Probio-TICK initiative).

And they are also looking for a full-time [Postdoctoral Research Fellow with molecular microbiology and genetics experience](#) to contribute to an NHMRC-funded research project examining the effects of metal stress on the nosocomial pathogen *Acinetobacter baumannii* during host infection.

MQ Women in Engineering Leadership Summit

Join us on **Monday 15 April** for a leadership summit which will help in nurturing leadership skills and provides a platform for networking with leaders from industry and academia. The event is organised for early to mid-career academic staff members and post-graduate students.

[Find out more about this event](#)

A gigantic frog in a strange land: the saga of the cane toad

The well-intentioned but desperately foolish introduction of South American cane toads to tropical Queensland in 1935 let loose a cascade of catastrophe—and at the same time, unleashed a storm of misinformation. Few creatures have been so universally reviled and so utterly misunderstood. Recent research has at last given us a clear picture of what cane toads are doing in Australia, how they have adapted to this continent, how they affect the native wildlife, and what we might be able to do about the warty little aliens.

On **Tuesday 16 April** Rick Shine will be speaking at this free 'Wildlife at the watering hole' event hosted by the Royal Zoological Society of New South Wales with the generous support of the Botany View Hotel.

[Find out more about this event](#)

University Bioquest is back

Calling all birdos, entomologists, nature lovers, photographers and Pikachu chasers, the University Bioquest is back **for the month of April**. Last year we won the Champion Identifiers Trophy and came fifth in the Spotters list. In 2019 we're taking it up a level! This year we need more teams and more team members.

Do you know something about the animals in your local area? Are you good at taking photos of unusual critters? Register with the Macquarie University Team in BioQuest today and join the Macquarie Clan, or start your own club clan. It's free to participate and more fun than Pokemon.

[Find out more](#)

"Women of Mathematics: A Gallery of Portraits" Exhibition Opening and Public Lecture

The Department of Mathematics and Statistics invite you to attend this event on **Thursday 2 May** celebrating Women of Mathematics! The evening will begin with a public lecture by Dr Karen Lamb, a biostatistician and researcher, followed by the opening of the exhibition, "Women in Mathematics: A Gallery of Portraits."

The Women of Mathematics exhibition is part of a travelling exhibition that started in Europe and highlights the work of a number of leading female mathematicians. It stems from the observation that nowadays, women still find it difficult to embrace a career in the mathematical academic world and the disparity between the proportion of men and that of women among professional mathematicians is still shamefully large. The exhibition offers a glimpse into the world of mathematics through photographs (by Noel Tovia Matoff) and excerpts of interviews (by Sylvie Paycha and Sara Azzali) of thirteen women mathematicians throughout Europe.

Dr Karen Lamb is a biostatistician and researcher. She is passionate about statistical communication and gets a real buzz out of helping researchers in other disciplines use statistics to answer research questions. Karen finds the process of making non-mathematicians comfortable with mathematics to be both challenging and hugely rewarding. As a result, the focus of her research has been as diverse as the people she has been fortunate enough to work with, including doctors, psychologists, epidemiologists, social scientists, biologists and many more!

Drinks and a light supper will follow the public lecture and exhibition opening.

[Find out more about this event and RSVP](#)

Connect with us

If you have comments, questions or research news you think might be of interest to the rest of Faculty, I'd love to hear from you. Drop me a line at fse.execdean@mq.edu.au.

Connect with your Faculty online:

- Website: science.mq.edu.au
- Faculty on Twitter: [@MQSciEng](https://twitter.com/MQSciEng)
- Barbara on Twitter: [@BarbaraMesserle](https://twitter.com/BarbaraMesserle)

[Got a story?](#)

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