MEDIA RELEASE: **FOR RELEASE APRIL 2018**

ONE BIG NIGHT, TWELVE SCIENTISTS
LIVE ON STAGE!

A fast-paced session of science, drama, genius and stories of STEM*

The FameLab semi-final in NSW is returning to the Powerhouse Museum on Wednesday 11 April 2018.

The ABC's Natasha Mitchell will MC the evening yet again this year and introduce to the stage some of the country's brightest minds to tell their science stories in three minutes or less and explain why their work matters to the world. Watch as these brilliant researchers deliver short sharp tales of their work in order to become the next FameLab champion.

Have you ever wondered what Quantum computing will actually mean for our future? Or about what nations take the most selfies and what that says about them?

Join us at this FREE event, presented by the British Council in Australia, to hear STEM researchers explain complex concepts while the clocks ticks - armed with only their wits and a few props! Jargon and PowerPoint are strictly banned.

Helen Salmon, Director of the British Council in Australia, says, "FameLab is such a fun way to immerse yourself in our awe inspiring world. Australian Dr Nural Cokcetin (2017 Global Runner Up) said a schoolgirl told her she had no idea that she could be creative and still be a scientist! Creative scientists are at the cutting edge of Australia's innovation economy, and many of them will change our lives through their work. Come along and let them show you how."

Creative scientists are at the cutting edge of Australia's innovation economy, and many of them will change our lives through their work. Come along and let them show you how."

The 2018 NSW semi-finalists are:

1. **Richard Charlesworth, University of New England,** Coeliac disease diagnosis can be a pain in the posterior
2. **Vanessa Pirotta, Macquarie University,** Drones: using emerging technologies for whale conservation
3. **Alexander Solntsev, University of Technology Sydney,** Quantum physics and the future of computing
4. **Kate Leslie, University of Sydney,** Light up your life
5. **Michael Widjaja, IThree Institute,** Using Cleavage as a Distraction
6. **Liam Scarratt, The University of Sydney,** A slippery future
7. **Khandis Blake, UNSW Australia,** What's the deal with sexy selfies?
8. **Adrianne Jenner, University of Sydney,** But wait! Isn't the flu bad?
9. **Tracey-Ann Palmer, University of Technology Sydney**, Fresh minds for Science

10. **Kate Samardzic, University of Technology Sydney,** Mitochondria: Cellular Superheroes and their Kryptonite
11. **Riti Mann, University of Technology Sydney,** We Are What We Eat: True for Bacteria Too
12. **Alfonso Ballestas-Barrientos,** Learning from trees: Artificial miniforests to nourish the world

Presentations will be judged according to FameLab's 3Cs: content, clarity and charisma - by an esteemed panel of media professionals, and public figures.

The winner will be announced on the night and will then go on to compete in the national final – hosted by superstar astrophysicist, Dr Alan Duffy – at the Octagon theatre, University of Western Australia in Perth on May 10. The Australian winner will then go on to compete at FameLab International Finals at the Times Cheltenham Science Festival in the UK in June.

Come along for a night that's guaranteed to be full of FameLabulous fun!

Date: April 11 2018

Time: 6.30 - 8.30pm – note: ***doors open at 6.00pm for a 6.30pm start.***
Location: Powerhouse Museum (MAAS), 500 Harris Street, Ultimo,
RSVP: https://www.eventbrite.com.au/e/famelab-2018-new-south-wales-semi-final-tickets-39381292506
Free event - all welcome

MORE ON OUR NSW FINALISTS FOR MEDIA:

Richard Charlesworth, University of New England, Coeliac disease diagnosis can be a pain in the posterior

The major focus of my research has been to improve the diagnosis of coeliac disease (CD). Currently the most conclusive form of testing for CD is based on an examination of tissue through a microscope. This form of testing is reliant solely on the skill of the observing pathologist however and there is the potential for subtle changes to be missed or misinterpreted. My current research involves the development and implementation of a novel genetic test for CD, an 87-gene qPCR array that can look at the expression of many different genes simultaneously in tissue. Using mathematical modelling of the data from this array, I have developed predictive equations, which can diagnose CD with 96% accuracy and no observer bias. I believe that this research could form the basis of a novel companion test for CD to improve diagnostic accuracy. It would also be useful in patients requiring rapid diagnosis/differential diagnosis or as a front-line tool in areas without access to specialised services. For the patients undergoing treatment for CD, these equations could be applied to follow-up biopsies to monitor their progress more closely.

Vanessa Pirotta, Macquarie University, Drones: Using emerging technologies for whale conservation

My research project investigated the use of emerging technologies such as drones to collect health information from free swimming whales. This involved the collection of whale blow/snot (the visible plume of spray) via a custom-built drone. Whale snot is a juicy organic mixture of DNA, hormones, lipids and microbiota. We wanted to collect baseline information via this method to assess its potential as a new standard for health assessments from whales. This project will benefit both whales and researchers. Previous methods to collect health information from whales came from those that stranded (in which case their health was compromised) or from those that were deliberately killed. Current methods involve being on boat and using a pole to collect whale snot, which can be dangerous for both the whale and researchers. My collaboration with industry to design and build our custom-built drones with remotely operated flip-lid (to minimise sample contamination) makes this project unique. We compared our findings with other studies and found an overlap in bacteria communities with other whales, dolphins and some non-marine mammals. This research method will completely revolutionise the way scientists collect health information from whales around the world.

Alexander Solntsev, University of Technology Sydney, Quantum physics and the future of computers

The holy grail of information processing is a superfast quantum computer. Once built, it will allow us to quickly discover new medical drugs, make precise climate change predictions and significantly boost artificial intelligence. However, testing quantum hardware is very hard, because it requires an enormous number of different measurements. With a team of collaborators, we have created a method that can test complex quantum systems in one go, without the need to do different measurements. This achievement is another piece of the quantum-computing puzzle that will speed up research, bringing quantum computers closer to reality. In the mid- to long-term future, it will affect everyone on this planet, giving our society unprecedented information processing power.

Kate Leslie, University of Sydney, Light up your life – the art of science

My project is about making fluorescent dyes and molecules that glow, I use them to see what is happening inside cells, which is otherwise a very difficult task. These molecules can be designed to report back (for example with a change of colour) on the existence of almost anything in cells. I am working on expanding the range of colours, as well as the brightness and the stability of these dyes so that researchers around the world will be able to choose the best tool possible for imaging their biological event. I have managed to make many new dyes with unique colours and abilities that can be used for biological research. For example, some of these can monitor the lack of oxygen in cells - that is a hallmark of cancerous tumours

Michael Widjaja, IThree Institute, Using Cleavage as a Distraction

My research is about looking at how a particular bacteria called Mycoplasma pneumonia interacts with our lung cells to cause disease. Specifically, I am looking at what tools this bacteria can use leading up to and during infection. This bacteria is one of the major causes of pneumonia primarily targeting children and the elderly. We have limited treatment options available for an infection from this bacteria and a working vaccine is non-existant. To discover a cure or vaccine, an understanding of how this bacteria works is required. My project will hopefully set the foundations to help create a working treatment against this bacteria. A surprising fact I found in my research is that this bacteria is able to multiply the tools it can use during infection. This mechanism called 'cleavage' has not been reported in this bacteria before. The cleavage allows the bacteria to have more tools to use to cause disease, without needing to make new tools. My theory is that the bacteria is able to overwhelm and confuse our immune system with this 'cleavage', and thus and help the bacteria survive during infection.

Liam Scarratt, The University of Sydney, A slippery future

We live in a world of surfaces that we control the properties of and protect by applying coatings. However, coatings found in your daily life have serious limitations in their use, and are unable to protect surfaces from fouling, a problem which plagues materials in marine environments, among many others. The hull of a ship in the ocean accumulates a layer of bacteria and proteins over time called a bio-film, enabling the attachment of larger organisms including barnacles, oysters and algae. This results in increased resistance moving through the ocean, increasing drag, spreading invasive species, and costing billions in damage and additional fuel costs. To prevent this, we need a surface that is so slippery that the bio-film can't form, and we do this via imitating the natural surface of the Trumpet Pitcher plant in nature, which is capable of trapping liquids in its special nano-scale structured surface (1000's of time smaller than the width a hair). I am studying the flow of liquids over artificial versions of this surface, with the aim to understand how they reduce drag on the nano-scale. This will help us understand what makes them so slippery and how to optimise them for practical use.

Khandis Blake, University of New South Wales, What's the deal with sexy selfies?

Worldwide, Google reports we upload 24 billion selfies a year, a phenomenal shift in the way women and men present themselves online. For women more so than men, these selfies often intend to present an alluring version of the self, leading scholars to see sexy selfies as just another manifestation of sexual objectification and gender oppression. Yet is it the case that women posting sexy selfies are succumbing to the patriarchy? Using big social media data, I tracked >400K sexy selfies from 113 nations online, to see which societies post more sexy selfies. I've found that indicators of gender oppression are poor predictors of sexy selfies, but that sexy selfies are strongly predicted by a society's level of income inequality. Using evolutionary theory, I argue that these patterns show that sexy selfies are most prevalent in environments characterized by high levels of female-female and male-male competition. When competition is fierce, one way women try to out-do each other and maximize their lot in life is to increase their attractiveness. Detailed experimental work in the lab also supports this conclusion. Overall, this work provides a fundamentally new way of understanding sexualisation online and what it means for societies.

Adrianne Jenner, University of Sydney, But wait! Isn't the flu bad?

For many years now, novel experimental ways of treating cancer have been developing, however, we are still a long way from a cure. My research looks at how mathematics can be used to bring us just that little bit closer to a more effective cancer treatment. For my PhD, I am focusing on three prominent experimental cancer treatments: viruses, nanoparticles and immune cells. Each of these treatments is completely different, however, they all share one important feature, mathematics can be used to understand each of them. Using a mathematical and computation model of each of these treatments, I simulate in silico all the possible ways we could modify each treatment and from this deduce which direction is the most likely to produce the most successful outcome. Currently, I am working closely with a Lab in Australia and Korea. From my research, I help biologists at these labs understand ways in which cancer treatments can be made more effective. In time, I believe my research will lead to a more effective cancer treatment, which will benefit society as a whole. I also hope that my research will inspire other young students to take up a career in mathematics.

Tracey-Ann Palmer, University of Technology Sydney, Fresh minds for Science

Traditional approaches to inspire Australian children to continue with science into the senior school and through into university appear to be failing. Marketing strategies are known to be effective and yet these powerful tools have not been utilised to understand why some students fail to choose science or address this problem. This research aims to determine whether marketing theory and rigorous marketing analysis can enhance our knowledge of how students choose to study science and suggest how we can improve enrolments. Standard marketing research techniques of focus groups, surveys and observations of the decision making environment will be used to gather information about the subject choice process. Analysis of these data within a marketing framework will allow the development of a marketing plan for science that considers the student as a customer considering the product or brand of "science". It is hoped this new approach will allow a set of strategies to be developed to package science as an attractive offering that appeals to modern students and so encourage more Australian children to study science.

Kate Samardzic, University of Technology Sydney, Mitochondria: cellular superheroes and their Kryptonite

Society has become more health conscious and with that there has been an increase in the amount of nutritional supplements on the market. Consumption is also increasing and even though they are already consumed by humans, there is still a lot about supplements that we don't know. My research screens some of the ingredients of these supplements for any potential adverse effects. I use a variety of toxicity assays and am most interested in a particular part of the cell, mitochondria. This is because mitochondrial dysfunction is linked to a wide range of diseases including Alzheimer's, Parkinson's, diabetes, heart disease and cancer. Alarmingly, I've found that some supplements are causing damage to mitochondria. Despite their quest for a healthier body, people taking these supplements could be causing unnecessary damage. Since up to 80% of the population are currently taking or have taken a supplement before, this research could impact a lot of people!

Riti Mann, University of Technology Sydney, We Are What We Eat: True for Bacteria Too

Bacteria are present everywhere, but only a small number of them can occasionally cause infections, making us sick. Bacteria cause infections by dividing quickly inside the human body, that is, by the process of one cell dividing into two cells at a fast pace. To fuel growth and division, bacteria need to find their favourite food and be able to process (use) it correctly. Like humans love to eat candies, one of the favourite food choices of bacteria is the simple sugar called glucose. We have found that when glucose is not processed correctly by bacteria, the bacteria cannot divide properly. We want to understand the link between food processing and cell division in bacteria—especially during infection, so that we can stop the bacteria from dividing by either supplying them with food they do not like or making them process their favourite foods incorrectly. This will kill the bacteria and prevent them from making us sick. This research uniquely aims at developing new antibiotics that can target two bacterial processes at the same time, thereby not allowing the bacteria to develop any resistance against such antibiotics, which is a global health issue in today's time.

Alfonso Ballestas-Barrientos, learning from trees: Artificial miniforests to nourish the world

My PhD research project is about the modification of the production of materials that when shined with light, are able to produce hydrogen from water. I have devoted my research to increase the efficiency of materials made of "Titania", the same component of sunscreens and paintings that can improve their resistance by absorbing solar light. To increase the efficiency of titania, I have changed the way that these materials are formed in solution and I have obtained different crystal shapes (rods, trees, flowers). A distinctive aspect of my project is that by adding small particles on the different crystals of titania, I can improve their ability to convert solar energy into hydrogen fuel. This project has a global impact as currently the burning of fossil fuels is the dominant energy source resulting in the production of gases responsible for environmental issues (global warming, acid rain, among others). In my research I propose new routes for the preparation of light-active materials that will represent a cleaner pathway for the generation of energy and will be able to compete with non-sustainable energy sources (coal, petroleum, and natural gas).

END:

Keep up with all of the action by following @BritishCouncilAustralia on Facebook and @auBritish on Twitter and Instagram, and join the conversation using #FameLabAus. For further information, visit famelab.org.au

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FameLab International has been running annually since 2007. So far, more than 9,000 researchers from 31 countries have brought their science to live audiences on the FameLab stage.

FameLab 2018 is presented by the British Council and Cheltenham Festivals | Founding partners: Western Australian Museum and The McCusker Foundation | Major partner: Woodside Energy Ltd | University partners: Curtin University, Edith Cowan University, Murdoch University, University of Technology Sydney and University of Western Australia | Venue partners: Museum of Applied Arts & Sciences, Queensland Museum, Museum Victoria, Western Australian Museum and Western Australian Museum Foundation | Queensland presenting partner: World Science Festival, Brisbane | WA presenting partner: the Department of Jobs, Tourism, Science & Innovation | UK Government partner: British High Commission | Media partner: Australia's Science Channel | Training and advocacy partner: Inspiring Australia

Notes to editors:

FameLab® is a competition owned and created by Cheltenham Festivals in the UK. The British Council has license to deliver the competition in over 30 countries overseas. Since its birth at the Festival in 2005, FameLab has grown into the world's leading science communication competition. A partnership with the British Council since 2007 has seen the competition go global with more than 9000 young scientists and engineers participating to date.

About the British Council

The British Council is the UK's international organisation for cultural relations and educational opportunities. We work with over 100 countries in the fields of arts and culture, English language, education and civil society. Last year we reached over 65 million people directly and 731 million people overall including online, broadcasts and publications. We make a positive contribution to the countries we work with – changing lives by creating opportunities, building connections and engendering trust. Founded in 1934 we are a UK charity governed by Royal Charter and a UK public body. We receive 15 per cent core funding grant from the UK government. www.britishcouncil.org

***STEM-** Science Technology Engineering & Mathematics