MEDIA RELEASE: FOR IMMEDIATE RELEASE **MARCH 2018**

ONE BIG NIGHT, TWELVE SCIENTISTS
LIVE ON STAGE!

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

The FameLab semi-final in VIC is returning to the Melbourne Museum on Wednesday 28 March 2018.

Scientist and FameLab alumni, Dr Niraj Lal will MC the evening and introduce some of the country's brightest minds to the stage as they tell their science stories in three minutes 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 why scientists don't share their information and what that might mean for discovery? Or what gut health has to do with recovering from cancer?

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 Victorian semi-finalists are:

1. **Rukshan Azoor, Monash University,** A predictive model for underground corrosion,
2. **Aidan Kashyap, Hudson Institute of Medical Research,** Preparing small lungs for life outside the womb
3. **Matthew Snelson, Monash University,** Brown foods can be bad for your gut
4. **Shelly Knotts, Monash University,** Dancing to Algorithms.
5. **Muthu Vignesh Vellayappan, Monash University,** Heart saving 3D printing and modelling
6. **Domenico Mazza, Monash University,** A virtual reality to help us see a new future
7. **Anna Riddell, University of Tasmania,** Geodesy is the science of measuring how the Earth moves
8. **Kate Secombe, University of Adelaide,** Measuring gut bacteria to predict cancer treatment outcomes
9. **Anna Oszmiana, University of South Australia,** Harnessing one more power of your gut - oral vaccinations
10. **Soniya Sharma, Australian National University,** Shedding new light on the universe through lenses.
11. **Toby Hendy, Australian National University,** A fresh approach to understanding sick plants – can we save coffee?
12. **Anisa Rowhani-Farid, Queensland University of Technology,** Creating a culture of open science and data sharing in research

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 10th May 2018. The Australian winner will then go on to compete at the FameLab International Finals at the Times Cheltenham Science Festival in the UK on 7th June 2018.

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

Date: Wednesday 28th March 2018

Time: 6.30 - 8.30pm. Doors open at 6.00pm for a 6.30pm start.

Location: Melbourne Museum, 11 Nicholson St, Carlton, VIC

RSVP: https://www.eventbrite.com.au/e/famelab-2018-victoria-semi-final-tickets-39381327611?ref=estw

Free event - all welcome

MORE ON OUR FINALISTS FOR MEDIA:

Rukshan Azoor, A predictive model for underground corrosion
Underground corrosion leads to significant economic loss in the maintenance of aging and buried infrastructure such as pipelines. Existing models for underground corrosion do not capture many of the phenomenological observations and have practical limitations in usage due to the lack of field data required as inputs. Soil aeration has been identified as a major influencing factor in soil corrosion but is not properly characterised. In this project, a mechanistic model has been created for underground corrosion, coupling electrochemistry and soil mechanics. It is possible to evaluate the influence of soil aeration and its impact on localized corrosion using this model. It is expected at the completion of the research project to produce an experimentally validated corrosion model which will be of practical use to the asset management community.

Aidan Kashyap, Preparing small lungs for life outside the womb
The transition to newborn life is uneventful for most babies, however some require assistance breathing at birth because their immature lungs are not ready for life in the outside world. One devastating cause of impaired lung development is congenital diaphragmatic hernia (CDH), which affects 1 in 3000 babies. Two-thirds of babies with CDH are diagnosed during a routine ultrasound scan at 20 weeks of pregnancy, so we are investigating promising new therapies that could be used to treat these babies before they are even born. The first therapy involves performing keyhole-surgery called "FETO" to place a small balloon in the developing baby's throat. To further improve survival, we are also investigating a medication that supports normal development of blood vessels within the lungs, so that when these babies are born, enough blood can flow through the lungs to collect oxygen for the rest of the body. Together, we hope that these two therapies may improve foetal lung development enough to help newborns and their parents, breathe a little easier

Matthew Snelson, Brown foods can be bad for your gut
Have you noticed that brown foods are delicious? Specifically those foods that turn golden-brown when they're cooked, like when bread is baked. When foods are cooked like this it increases the 'browning compounds' that give food a really nice taste and aroma, and we eat a lot more of them in today's modern, processed diet. Unfortunately, a diet that's too high in these browning compounds can contribute to chronic kidney disease, which affects 1 in 10 Australians. Most of these pass through to the colon where they can affect the gut bacteria. My research is using a special type of dietary fibre to try and reverse this kidney damage. I've shown that a processed food diet does lead to more kidney

damage and alters the gut, with a shift towards more “bad” bacteria and when we add fibre this shifts the gut bacteria back towards a more balanced, healthy mix and also reduced the kidney damage caused by a processed food diet. This research shows a practical way in which we can make our current diets healthier, by adding a special fibre to the processed foods people are choosing to eat, to promote healthier guts and healthier kidneys.

Shelly Knotts, Dancing to algorithms
My work explores critical approaches to technology through creative practice. Live Coding involves improvising music, visuals or other creative input through programming in front of an audience. Algoraves are events that happen world wide where performers live code dance music and visuals in club contexts and other informal settings. It encompasses a wide spectrum of practices but is focussed on beat-based music. In my theoretical work around this practice I am interested in the role of error and failure in shaping the music. For example algorithms written live often produce unexpected outcomes and typographical errors that can lead to software crashes. This impacts the shape of the music. From a broader perspective live coding considers programming from a human-centric process perspective, rather than the product/end goal perspective of much of the computing industry. Live coding in public/informal settings introduces non-specialists to the process of programming giving a greater understanding of the human production behind technology.

Muthu Vignesh Vellayappan, Heart saving 3D printing and modelling
Heart disease is the leading cause of death in Australia killing one Australian every 12 minutes. After a heart attack, 2 to 3 million heart cells are dead. During the recovery process, the skin cells will grow more quickly than the heart cells at the damaged location leading to scar formation, which further limits the contractility activity of the heart. Scientists have tried injecting heart cells to the damaged location, but they don’t stay there. Different cardiac patches have also been tested yet the heart cells were not happy with the material. Hence, sandwich theory was used in this research to solve the problem. 3D printing was utilized to print layer by layer of 2 different materials. Later, one material was removed using salt water just like taking a part of a cheese from the sandwich. This results in a groove in the material. The heart cells are in elongated shape and they do the wringing movement synchronously to result in a single heartbeat. Thus, the fabricated material with tracks will help the heart cells to stretch and elongate during each heart beat resulting in effective and happy colony of heart cells.

Domenico Mazza, A virtual reality to help us see a new future
My research involves developing ideas for a speculative augmented/mixed reality for computing as part of a practice based research project. The project will benefit anyone that engages with a computer, as the research aims to illustrate how we might interact using computers if we could freely place virtual objects on ourselves and the environment around us and draw connections between various artefacts and events. The research has the potential to show us how such a virtual world would work. The current aim of the work is develop a variety of scenarios involving this speculative computing which can be acted out and developed into compelling computer interactions.

Anna Riddell, Geodesy is the science of measuring how the Earth moves, let’s look at Australia!
You might think that we live on a planet that stays static, but let me assure you that everything moves. Think of all the changes that happen, not only on the surface of the Earth, but deep down like earthquakes, volcanoes, melting ice, ocean tides and currents, plate tectonics as well as the rotation of Earth itself. All these movements mean that the Earth is adjusting to re- balance the motions on the surface and deep within the planet. Geodesy is the science of measuring and representing the Earth, tracking changes to the size and shape including its gravity field in a 3D time varying space. My current research looks at how the Australian tectonic plate is drifting and how this effects our estimations of sea level change. The Australian plate is one of the fastest moving plates horizontally, travelling about 7

centimetres per year, which is faster than the rate at which your fingernails grow! My research focuses on the up and down motion of the surface of the Earth and measuring the wiggle of the centre of the Earth to improve sea level estimates around the Australian coast.

Kate Secombe, Measuring gut bacteria to predict cancer treatment outcomes
Cancer treatment (including chemotherapy and radiotherapy) comes with a raft of unwanted side effects. These can range from acute to long lasting, and often influence the effective treatment of the cancer itself. Up to 80% of people undergoing cancer treatment will suffer from gastrointestinal side effects, including abdominal pain, ulceration and diarrhoea. These issues, along with more serious complications, results in increased hospital stays and an increased economic cost. Currently, we don't have an effective treatment for these gastrointestinal problems. We do however know that the bacteria that live in the intestine are really important. We know that the balance of gut bacteria significantly changes during chemotherapy, towards more 'bad' species and less 'good' species. However we don't know if the type of bacteria each person has before cancer treatment begins will affect risk of severe gastrointestinal problems. My project aims to use faecal samples to understand if pre-treatment bacterial levels influence how sick patients will become. This project is working towards discovering a diagnostic marker. This marker may be used to personalise cancer treatment to patients, ensuring severe diarrhoea and illness is minimised while still effectively treating cancer.

Anna Oszmiana, Understanding drug delivery methods to improve compliance and vaccination rates in developing countries
Oral route of medication administration is simple and convenient. Nevertheless, for drugs consisting of proteins, injections remain the most common administration route due to their sensitivity to harsh conditions in the gastrointestinal tract. Extreme acidity and digestive enzymes in the stomach, which extract the energy from food, can also damage protein therapeutics. My works test whether enclosing proteins in more resistant carriers could improve their delivery and uptake by the intestine cells. We are especially interested in provoking long-lasting antibody responses within the gut mucosa for oral vaccinations. To understand what factors should be taken into account for designing the optimal formulations, we systematically study the interactions of protein-loaded vehicles with gut cells. For example, we test how the size and presence of other substances affect the passage of carriers through the mucus layer. This guides the development of improved carrier systems. Since many societies are currently facing confusion caused by false or inaccurate information and decrease in compliance, it is of particular importance to develop reliable systems for oral vaccination which are likely to be broadly accepted by patients. In addition, due to the simplicity of administration, such systems could also improve the vaccination rates in developing countries.

Soniya Sharma, Shedding new light on the universe through lenses.
My research aims at building a deeper understanding of the way galaxies form and evolution. Astronomers know a lot about the galaxies that are older and therefore closer to us. But in order to fully understand the evolution chain of galaxies, it is important to study them in their initial stages of formation. I make use of natural telescopes in the universe called "gravitational lenses" to observe the distant newly born galaxies. Very massive bodies like Clusters of galaxies act as efficient "lenses" and magnify the background objects just like the magnifying glasses magnify anything beneath them. However, this "lensing effect" also distorts and stretches the light from the background young galaxies, which makes it difficult for us to directly study them. In my PhD, I am developing tools to accurately model mass distribution of lenses to better understand the distortion caused by them to the background young galaxies. Then we can undo the distortion caused by lenses and reveal the actual physics in these galaxies. The present understanding of the inaccuracies in mass models of lenses is very limited and my research pushes the boundaries to shed new insights about the distant universe.

Toby Hendy, A fresh approach to understanding sick plants
I poke plants with tiny needles in order to understand how plants defend themselves from diseases. Hopefully we can use this knowledge to create more resistant crops and decrease world food shortages. My needles mimic the way that a pathogen would pierce through a plant cell to spread disease. So far I have helped to find a new minimum pressure that can trigger a defence response in the plant, such as stiffening of the cell wall. As a physicist I never expected to end up working on an inherently biological problem, but looking at the mechanical aspects of infection is a fresh approach. I think a problem as broad as plant disease needs fresh approaches to break new ground. The coffee crop is one species at risk of disease infection, so I hope anyone who has had a cup of it to drink today can appreciate the importance of this work.

Anisa Rowhani-Farid, Creating a culture of open science and data sharing in research
Scientists collect data and they don't have a habit of sharing it. Science is a body of knowledge that allows humanity to understand the laws of the universe and to surpass them. Science is fundamentally open in its nature. Practicing open science commits researchers to revealing and sharing the entirety of their results, methodologies, code, and data. Data is the foundation of health and medical research, the basic building block of knowledge. Data sharing promotes the verification of research findings and the evidence for the published body of scientific knowledge. Transparency and reproducibility are elements central to strengthening the scientific method, and data provides the key to scientific truth. If data is undermined, then the foundation of health and medical research is lacking. We are living in the midst of a reproducibility crisis. In 2012 it was found that 47/53 cancer papers published in Nature were irreproducible. So, how can we improve research practices to free hidden data? My research looked at this, with a particular focus on the role journals play through their data sharing policies and incentives for researchers to share data

END:

Keep up with all of the action by following British Council Australia 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