Talking Science Series 2019-20

All talks take place at 13:30 and again at 19:00, will last for approximately 1 hour, plus up to 15 minutes for questions. Tickets for each lecture are released on 5th of the previous month.

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FRI 12 JUNE, 1:30pm/7pm - audience all ages

**Saving the Mary Rose cannonballs**

Hayley Simon, UCL/Diamond

When Henry VIII’s flagship, the Mary Rose, sunk off the coast of Portsmouth on 19th July 1545, she took over 1,200 cast iron cannonballs with her into the depths of the Solent. Since excavation in the 1980s, the cannonball collection has begun to rust and degrade, despite conservation efforts to minimise loss. This talk shows how cutting-edge scientific analysis performed at Diamond Light Source – the UK’s national synchrotron facility – has enabled us to begin to understand how this unique Tudor collection corrodes and why different preservation treatments have either failed or succeeded to conserve the artefacts.

**Talks take place in the Pickavance Lecture Theatre at the Rutherford Appleton Laboratory.**

Please visit our website for directions: http://www.stfc.ac.uk/how-to-get-to-ral

For the lunchtime talks please be aware that we have limited parking on site and request that you use public transport if possible. Please indicate when booking if you are a Blue Badge holder and we will give you priority parking on site. Harwell Campus is well served by local buses during the day. If you do arrive by car please follow Parking Signs, which do change from time to time, and always sign in at the Main Reception.

For evening talks parking is available on site.

A hearing loop is installed in the lecture theatre and disabled access is available. Please let us know when you book if you need any adjustments or assistance. Children under 16 must be accompanied by a responsible adult.

**Booking is essential:**

Book online at [eventbrite.co.uk](http://eventbrite.co.uk)

[stfc.ukri.org/rltalkingscience](http://stfc.ukri.org/rltalkingscience)

Queries to rltalkingscience@stfc.ac.uk
How do we know anything? And how can we know things better?
Michael de Podesta, National Physical Laboratory
Measurement is at the heart of all science and engineering and progress in science and engineering is often linked to progress in metrology – the science of measurement. After all, if we cannot measure something then we cannot begin to understand it (science) or improve it (engineering). In this talk Michael will explain how the International System of Units works and why, in May 2019, scientists implemented subtle but profound changes in the definitions of four of these base units – the kilogram, ampere, kelvin and mole.

Bring back the king: the extraordinary science of de-extinction
Dr Helen Pilcher, Science Writer, Performer and Author
If you could bring back one living thing from the whole of the history of time, what would you choose? Author, comedian and former stem-cell biologist Helen Pilcher has thought about this problem a lot. Join Helen as she explains the cutting-edge science that makes the resurrection of extinct animals a very real possibility and explains how this can help us protect other endangered species from extinction. Hear her choices from eras gone by - from the King of the Dinosaurs - Tyrannosaurus Rex, to the King of Rock ‘n’ Roll - Elvis Presley.

Vampires – not for the nervous!
Dr Kathryn Harkup, Science Communicator
There are hundreds of stories of vampires from across the globe. Ever wondered if there is more to Dracula than a pale complexion and difficulties shaving? What if vampirism is a real phenomenon? This talk is a spooky tour through the history of vampires with frightening folklore, blood sucking bats and sinister scientific stories.

Energy and climate change
Sarah James, STFC, Energy Research Unit
Climate change is an urgent issue for us humans and we must take major action in the next decade if we want to minimise the danger we pose to ourselves and other life forms. Our current energy systems are a root cause of the problem so we need to transform them. Sarah will talk about the UK’s energy systems, how they are changing already, how they might change in the future and what that could mean for us.

Genesis of a Queen: Queen Mary 2
Dr Stephen M. Payne OBE FREng FRINA, Designer Queen Mary 2
Stephen Payne, Chief Designer of the ocean liner Queen Mary 2, will present an illustrated lecture describing how this iconic passenger ship was conceived and built. The Queen Mary 2 is the only ship that can be described as an express liner, and regularly maintains Cunard Line’s transatlantic service between Southampton and New York. A very personalised account, the lecture will highlight the importance of working together as a team and never giving up on ambitions and dreams.

Earth’s climate evolution: 800 million years of climate change and its multiple causes
Dr Colin Summerhayes, Scott Polar Research Institute, Cambridge University
What drives climate change? Geology helps us answer that, because Earth’s climate has ranged widely through time and its history is trapped in marine sediments and ice cores. Volcanic emissions of CO2, modulated the Sun’s effects, as did chemical weathering and the growth of plants. Changes in the Earth’s orbit and axis provided further but sligher change. Solar variability provided yet smaller change. Our climate is the product of these drivers. Our current climate should be like that of the Little Ice Age. Greenhouse gas emissions explain why it is not. We can all do something about that.

Engineering enzymes to digest our most polluting plastics
Professor John McGeehan, Director, Centre for Enzyme Innovation, University of Portsmouth
John McGeehan is a Professor of Structural Biology focused on the global challenge of plastic pollution. Their latest work is revealing how an enzyme works to digest polyethylene terephthalate (PET); the main plastic used in single-use drinks bottles. PET can take hundreds of years to break down in the environment, and together with other plastics, is causing a huge pollution issue across the world. We are now engineering this enzyme to work faster so that it can be used to recycle plastic back into its original building blocks. This would allow proper circular recycling and help to reduce the pollution in our oceans.

From citizen science to genetics: How can you help us tackle the resistance of tuberculosis to antibiotics?
Dr Philip W Fowler, Nuffield Department of Medicine, John Radcliffe Hospital, University of Oxford
Tuberculosis is a disease that has afflicted humans for thousands of years and kills more people worldwide than any other infectious disease. In this talk Philip will explain how scientists have reduced the time it takes for doctors in the UK to find out which antibiotics will work by examining the genetic code of each case of tuberculosis (TB). To make this even more accurate, over 20,000 samples of TB have been collected by the end of 2020 and you can help us analyse all this data!