

**2021**

**20 Jan** **Science and the Medicine of Eyes - With An Eye to the Future**

*Dr Chris Gorman - University Hospital of Wales*

**3 Feb** **Life in the Balance**

*Professor Robert Pickard – Cardiff University*

**17 Feb** **Past President and IOP Lecture  
Shape, Form and Architecture in the Crystalline World**

*Professor Kenneth Harris – Cardiff University*

**3 Mar** **Royal Society of Biology Lecture  
Huntington's Disease: Genetics, Ethics and Hope for the Future**

*Dr Emma Yhnell - Cardiff University*

**17 Mar** **Royal Society of Chemistry Lecture  
The Air We Breathe: Aerosols for Good and Bad**

*Professor Jonathan Reid – University of Bristol*

**31 Mar** **Man Made Global Warming or Natural Climate Change?**

*Professor Charles Harris - Cardiff University*

**14 Apr** **DNA Fingerprinting, Forensics and Crime**

*Dr Rhian Morgan - Wales Gene Park*

**28 Apr** **Domestic Science: Folk Physics and Automation in the Pursuit of Home Comforts**

*Professor Chris Tweed - Cardiff University*

**2021**

**20 Jan** **Science and the Medicine of Eyes - With an Eye to the Future**

**Dr Chris Gorman**

University Hospital of Wales

This is a talk that weaves together diverse subjects from medicine and eyes, to science and history. Starting from the formation of the Royal Society over 350 years ago, it aims to demonstrate how the application of the new scientific analysis, to the then aged and stagnating art of medicine, transformed medicine's ability to successfully treat patients. Particular reference is made to blinding eye conditions. The speaker will also detail how scientific 'royalty' throughout the ages have been fascinated by the subject of light and how we perceive it. This fascination has been harnessed to revolutionise our understanding the working of our visual system, from the eye to the brain. In a final twist the speaker will endeavour to show how this increasing understanding about our own vision, has serendipitously transformed diverse scientific disciplines, in particular Information Technology, and how as a result, Data Science is at this very moment set to transform the future world in which we will live.

**3 Feb** **Life in the Balance**  
**Professor Robert Pickard**  
Cardiff University

This talk looks at the rhythms that exist in the world around us and within our own bodies. It explores why rhythms exist and what they can tell us about the stability of a system. A system is any part of the universe that we can draw a line around and define conditions within that line that are notably different to the conditions that are external to it. Universes, galaxies, planets, nations, human beings, brains, cells and atoms are all systems. They all oscillate about a mean equilibrium position. Order and chaos, life and death, health and happiness: all governed by the same mathematics that give us economic stability, sonnets, music and peace.

**Past President Lecture**  
**17 Feb** **Shape, Form and Architecture in the Crystalline World**

**Professor Kenneth Harris**

Cardiff University

The architecture of crystalline solids has a particular aesthetic appeal, in view of the ordered regularity and symmetric arrangements of the atoms and molecules within such structures, and their analogies to architectural features in the world around us. However, exploring the nature of crystalline materials beyond such superficial analogies reveals a fascinating world of intricacy, complexity, dynamic change and surprising behaviour. The lecture will take a wandering journey through the world of crystalline materials, highlighting a range of structural concepts of contemporary interest and the powerful experimental techniques that are yielding deeper and deeper insights into the secrets of this fascinating world.

*Sponsored by the Institute of Physics*

**3 Mar** **Huntington's Disease: Genetics, Ethics and Hope for the Future**

**Dr Emma Yhnell**

Cardiff University

Huntington's disease is a rare neurodegenerative condition and due to the genetic cause of the disease, there is a fifty percent chance of passing the condition on to any children. The disease will lead to fatality ten to fifteen years after clinical diagnosis. Huntington's disease presents a number of fascinating ethical, moral and societal dilemmas. The Huntington's disease community are closer than ever to a treatment for this condition, but with a potential treatment on the horizon, how does it work and what other challenges might exist?

*Sponsored by the Royal Society of Biology*

**17 Mar The Air We Breathe: Aerosols for Good and Bad**

**Professor Jonathan Reid**  
University of Bristol

Commonly, we think of aerosols as referring to spray cans used to deliver personal care products. However, an aerosol is a dispersion of any form of particulate matter in a gas phase. Aerosols not only represent one of the largest uncertainties in climate change, through their impact on clouds and radiative forcing, but they are a common vector in the transmission of disease and are a significant component of polluted air impacting on health. Indeed, there is considerable uncertainty about the role aerosols play in the transmission of SARS-CoV-2 in the current pandemic, the value of wearing face masks and the importance of physical distancing. Conversely, they can be used to deliver drugs to the lungs to treat respiratory diseases and provide an increasingly versatile approach to make new materials. In this talk, we will explore the unique properties of aerosols and why they are so challenging and elusive to study.

*Sponsored by the Royal Society of Chemistry*

**31 Mar Man Made Global Warming or Natural Climate Change?**

**Professor Charles Harris**  
Cardiff University

In this talk we will first explore the composition of the Earth's atmosphere and the processes by which the Earth and its atmosphere are warmed by the sun, through the "greenhouse effect". Natural climate changes during the Earth's recent geological history will then be outlined, and their causes discussed. Man-made atmospheric changes since the industrial revolution will then be considered and their influence on atmospheric temperatures described. Recent measurements of the impact of these changes in arctic regions of the Earth will then be briefly presented, before we review detailed climate trends and consider their causes and the potential consequences for our planet.

**14 Apr DNA Fingerprinting, Forensics and Crime**

**Dr Rhian Morgan**  
Wales Gene Park

Join Wales Gene Park for a talk on DNA fingerprinting, forensics and crime. Discover more about DNA fingerprinting, how it was discovered by Professor Sir Alec Jeffrey and how it can be used in criminal investigations, with examples of cases where DNA evidence has played a role.

**28 Apr Domestic Science: Folk Physics and Automation in the Pursuit of Home Comforts**

**Professor Chris Tweed**  
Cardiff University

Widespread use of central heating in Britain's homes began in the 1950s. Since then, houses have become more sophisticated, adopting new technologies in the pursuit of greater comfort using less energy. The contemporary house often resembles a piece of equipment as much as a dwelling. New technologies demand new skills from householders, because modes of operating new homes can be counter-intuitive. As a result, developers often suggest "smart" controls and automation to address perceived "user incompetence". But before we go fully automatic, it is worth mining the wisdom of "folk physics" to see if it can make homes more effective rather than merely efficient. This talk will explore householder's everyday mental models to see if and how humans and machines can work in harmony to create more comfort with less energy.

**ORGANISING COMMITTEE**

President Prof. Sir Richard Catlow FRS  
Past President Prof. Kenneth Harris  
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**LECTURE DETAILS**

The 2021 virtual programme will be delivered via Zoom. It is free to download on most PCs, laptops, tablets and smartphones. The features of the platform will allow for the audience to ask the speaker questions in a similar fashion to a traditional lecture, and we will also be able to record the session allowing members to catch-up if they are unable to watch live. The joining details to access the session will be provided in the week prior to the lecture to those members that have registered.

**Lectures start at 7 PM**

**MEMBERSHIP**

**Annual membership for 2021 is £10 and will give access to all 8 lectures. Membership is free for students and under 18s.**

To become a Member, please sign up on the website or send a cheque made payable to Cardiff Scientific Society, with your name and address details to:  
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