



# Keele Physics Centre: Evening Lecture Programme 2022-23

13<sup>th</sup> October 2022

**Ashish Sharma & James Hackney**  
*University of Wolverhampton*

## Eratosthenes

Eratosthenes, who, contemplating a mere shadow, worked out with uncanny accuracy the size of Earth. This talk will discuss the recreation of his experiment and the myths and reality of the results. It will be presented, in character, by students from the University of Wolverhampton.

17<sup>th</sup> November 2022

**Mitchell Perry**  
*University of Sheffield*

## Quantum Sensors for the Hidden sector (QSHS)

Axions are a well motivated candidate for dark matter. The most sensitive experimental detection setup is currently the Axion Dark Matter eXperiment (ADMX). We describe the origins of dark matter, the axion, current experimental configuration and novel resonant feedback techniques aimed at increasing the rate of coverage of axion masses. How we hope to achieve this with the Quantum Sensors for the Hidden Sector (QSHS) collaboration.



26<sup>th</sup> January 2023

**Dr Kate Lancaster**  
*University of York*

## Is it Possible to Build a Star on Earth

Trying to recreate the energy source of the stars, nuclear fusion, on earth presents huge challenges in physics and engineering. This talk is the story of how, in the absence of a lab the size of a star, we are attempting to make fusion into an energy source for the future.

There may also be several additional lectures added to this series after this programme is published. Please check [www.iop.org/events](http://www.iop.org/events) for the latest information.

In order to improve accessibility, all our talks within this programme will be accompanied by a British Sign Language interpreter.



16<sup>th</sup> February 2023

**Dr Ronald S Gamble Jr**  
*NASA Goddard Space Flight Centre*

## The Nature of Cosmic Geometry

Over the last several decades there have been numerous results and discoveries in the observations of black holes. From the abstract genesis of the General Theory of Relativity by Albert Einstein to the most recent observations by the Event Horizon Telescope, we have seen the dynamic nature of black holes, their interaction with matter, and their influence on the geometry of spacetime.

This talk will provide an overview of the intricacies and the interplay between black holes and the motion of matter-energy with respect to the local structure of spacetime that surrounds them. A general description of the structure of spacetime surrounding a rotating black hole will also be provided.



16<sup>th</sup> March 2023

**Dr Tianning Xu**  
*ChargePoint*

## Electric Vehicle Charging

The electrification in this world is being accelerated due to obvious environmental reasons and electric mobility is an important contributor for this transition. To make this happen, it is essential to have an equivalent penetration of electric vehicle (EV) chargers so the infrastructure is there to support the growth. Also, it is important to offer the best EV charging experience for the drivers as well as asset management solution for the owners.

In this talk, Tianning Xu, the Director of Engineering from ChargePoint, a leading electric mobility charging solution provider in the market, will explain how and why EV charging is playing a critical role in this transformation as well as outlining the challenges ahead including the implication on the grid/vehicles.



20<sup>th</sup> April 2023

**Dr John Mansfield**  
*University of Michigan*

## Micro-characterisation Applications of Cultural Artifacts

The application of advanced micro and nano-scale characterization techniques is now popular in the study of cultural heritage artifacts. This presentation will highlight a number of such applications from the wide range of collaborations with non-profit institutions in southeastern Michigan. Analyses were performed by optical microscopy, transmission and scanning transmission electron microscopes and environmental scanning electron microscopy.

## Venue

LJ1.75  
**Lennard-Jones Laboratories**  
Keele University  
ST5 5BG

Tea and coffee is available from 6pm in the Lennard-Jones foyer. Talks start at 7pm and are followed by Q&A. These talks are open to the public and are sponsored by the IOP West Midlands branch. There is ample car parking space on campus which is free in the evening.

