



# Birmingham Physics Centre: Evening Lecture Programme 2022

4<sup>th</sup> October 2022

Georgina Dransfield  
University of Birmingham

## The Hunt for Alien Worlds

It took astronomers over a thousand years to convince themselves and the world that Earth and the solar system are neither special nor unique. However, having discovered more than 5000 planets orbiting other stars, we have yet to find a single system like ours. Could this place be unique after all? Are Earth-like planets around Sun-like stars inherently hard to form? Or is there some observational bias in the way we search for planets?

Join us on a journey through one of the most rapidly growing fields in astronomy: Exoplanetology. In this lecture you will hear the story of the first exoplanet discovery, and you will learn about the most popular and successful detection methods, as well as the most challenging and innovative techniques.



1<sup>st</sup> November 2022

Dr Swetha Bhagwat  
University of Birmingham

## Black Holes and Gravitational Waves

Black holes are ironically the simplest yet one of the most bizarre objects found in the universe. When two black holes collide, they cause ripples in the spacetime called gravitational waves that can be measured by Gravitational-wave observatories like LIGO, Virgo and KAGRA. Gravitational waves observed as two black holes merge originate from dynamics governed by strong gravity and thus provide us with an opportunity to understand how strong gravity behaves.

In this talk, we will discuss how their detection is used to understand the nature of black holes and the dynamics in strong gravity around them and further review the historical first detection of gravitational waves from a binary black hole merger observed by the LIGO detectors in 2015 — the GW150914 event.



6<sup>th</sup> December 2022

Catherine Siddle  
& Professor Michael Holynski  
University of Birmingham

## Quantum Sensing – a New Window to the Underground

Have you ever wondered what is beneath your feet? The underground world contains secrets about our history, and also provides a home for many of our critical utilities and resources. While these are essential to our daily lives, we often do not know exactly where they are – making them difficult to repair or replace, leading to holes being dug in the wrong place. This causes congestion and delay on our roads.

In this Christmas lecture, you will hear about our work in quantum sensing and will also have the opportunity to see the live generation of cold atom clouds – around a million times colder than liquid nitrogen, and one of the coldest things you can see with your eye – and, for the intrepid, to try cooling and trapping some atoms yourselves.



2023 Talks

**31 January 2023:** Multi-messenger Astronomy by Dr Samantha Oates

**28<sup>th</sup> February 2023:** Future Technology for Particle Physics by Dr Laura Gonella

**28<sup>th</sup> March 2023:** What's New in Particle Physics by Professor Cristina Lazzeroni

Please check [www.iop.org/events](http://www.iop.org/events) for full details and the latest information.

Venue

Large Lecture Theatre  
Poynting Building, Top Floor  
School of Physics and Astronomy  
University of Birmingham  
Edgbaston  
Birmingham B15 2TT

## Getting Here – Edgbaston Campus

There is no requirement to pre-register for these events.

Doors to the Large Lecture Theatre will be open from 7pm and talks begin at 7.30pm.

It is requested that if you feel unwell or have symptoms of COVID, you do not attend. Mask wearing is encouraged but not mandatory.



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online - visit [iop.org/events](http://iop.org/events) to register  
on-site at the University of Birmingham

IOP Institute of Physics