Keele Physics Centre: Evening Lecture Programme 2021-22

Keele UNIVERSITY

21st October 2021
Why the world is simple: from evolution to algorithms

Prof. Ard Louis
University of Oxford

In this talk we will show that the coding theorem predicts that random mutations in evolution are exponentially more likely to generate simpler, more compressible outputs. This algorithmic picture implies, for example, a bias towards higher symmetry, since more symmetric structures can be described in more compact ways by repeating a simple unit. Evidence for this strong bias towards simplicity and symmetry has been found in protein clusters, the structure of RNA, and in gene regulatory structures. Interestingly, these same principles predict an Occam's razor like bias in machine learning methods such as deep neural networks as well, suggesting an intriguing link between theories of learning and biological evolution.

18th November 2021
The fantastic world of two-dimensional materials!

Dr. Juliana Morbec
University of Keele

In this seminar, Dr Juliana Morbec will take you on a journey to explore the world of two-dimensional materials, this class of very thin materials that has been showing huge promise for a variety of technological applications. She will discuss what makes such materials so attractive and how they can revolutionize the development of future technological devices.

Due to COVID-19 the lectures within this programme are to be delivered online using the Zoom platform, not in person at Keele University. Please use the links at the top of each talk listing to register. All the lectures are **free** to attend. If you have any questions regarding this lecture programme, please contact:

Scott Walker (s.r.walker@keele.ac.uk)

16th December 2021
Gravitational waves

Dr. Patricia Schmidt
University of Birmingham

Gravitational waves -- minuscule distortions in the fabric of spacetime -- were first predicted by Albert Einstein in 1916. They are created in cataclysmic events throughout the Universe. Using some of the most precise rulers ever built, gravitational waves were detected for the first time in 2015. This ground-breaking discovery has opened a new window onto the cosmos: Gravitational waves provide unique information about the most energetic astrophysical events, revealing insights into the nature of gravity, matter, space, and time. To date, many tens of gravitational waves originating from the collisions of black holes and neutron stars have been identified, giving us extraordinary new insights into the inner workings of our Universe. In this lecture, I will look at the universe through Einstein's eyes: I will discuss the detection of gravitational waves as well as some of the most remarkable observations in recent years and their dramatic consequences for our understanding of the Universe.

24th February 2022
Dusty beginnings!

Dr. Nina Sartorio
University of Cambridge

Just like on Earth, dust is found everywhere in space, even in places we did not quite expect. In the last decade, surveys have unveiled an unexpected large amount of dust present in the most distant galaxies. This was surprising because these galaxies were the first to form after the Big Bang, a time when most metals were absent and, thus, the constituents of dust were not abundantly available. In this lecture, I will show how dust determined the evolution of the universe and unveil the mysterious dust sources at the earliest moments in the cosmos.

5th April 2022
HyDeploy: Introducing H_2 into the UK gas grid

Tommy Isaac
Progressive Energy Ltd

Learn about the key outcomes and findings of the UK's first live trial of hydrogen blending into a gas grid, which took place here at Keele University between October 2019 – March 2021. Alongside this, a broader overview of the current status of the HyDeploy project will be provided; demonstrating how this ground-breaking project fits into the UK's Net-Zero strategy in kickstarting the hydrogen conversion journey.

In order to improve accessibility, all our talks within this programme will be accompanied by a British Sign Language interpreter. There may also be several additional lectures added to this series after this programme is published. Please check www.events.iop.org for the latest information.

IOP Institute of Physics

Venue: LJ1.75, Lennard Jones Laboratories, Keele University, ST5 5BG
Tea and coffee is available in Lennard Jones foyer from 6.00pm. Talks start at 7.00pm and are followed by Q&A
These talks are open to the public and are sponsored by the **West Midlands Branch** of the Institute of Physics
There is ample **car parking** space on campus which is **free** during the evening