# The Bristol Scientific Club Programme of Meetings for 2024 -2025

Please see https://bristolscientificclub.org/programme/ for updates

### (1) Saturday, 12 October 2024 Guest Speaker: Dr Alan Donaldson: "All you've ever wanted to know about Genetics and Cancer ( or as much as you can reasonably absorb in an hour!)"

The role of the cancer clinical geneticist has fundamentally changed over the past 20 years. Initially referrals to the clinical genetics services regarding hereditary cancers made up only a small proportion of all referrals. Traditionally the role of the cancer clinical geneticist was to advise patients regarding their risk, organise surveillance, and for a small proportion of individuals where there were well recognised genes which could be associated with the cancers, genetic testing. But our knowledge of genes associated with hereditary cancer at the time was small.

This started to change with the completion of the human genome mapping project in 2003 (this took 13 years and cost 3 billion dollars). Followed by advances in DNA sequencing, Next Generation Sequencing (NGS) which enabled rapid sequencing of both germline and tumour DNA and at a much lower cost, enabling laboratories to through put many more samples and much more quickly. We have also had the establishment of large population databases of gene variants which have enabled more accurate interpretation of the variants found.

We are now in the era of genomic medicine. In this talk I am planning to show how the role of the cancer clinical geneticist has changed and how DNA technology can be used in the management of patients in the present and in the future.

Dr Donaldson has worked for UHBW as a consultant in Clinical Genetics with an interest in cancer and as cancer lead since 1999. He attended Glasgow University as an undergraduate where he was fortunate enough to be able to take two years out of Medicine in order to study for an honours degree in genetics. This was a very exciting time in genetics, the first 'genetic engineering ' experiments had been carried out a few years previously and human insulin gene had just been cloned. On returning to the medical faculty he decided to pursue a career in Clinical Genetics, even thought there were few trainees and consultants in the country. Following membership, he worked for three years for the Medical Research Council at the sickle cell unit in Jamaica, and then returned to work as a clinical Genetics trainee in Birmingham, prior to coming to Bristol.

#### (2) Friday, 29 November 2024

# Guest Speaker: Dr Gillian Juleff: "Monsoon Steel: Sri Lanka's contribution to the History of Science and Technology."

Dr Juleff's work on previously unknown first millennium AD wind-powered furnaces for the mass production of iron and steel in Sri Lanka (Monsoon Steel) resulted in a fundamental paradigm-shift in her field and established her international reputation. From featuring on the front cover of *Nature*, the work has stood the test of time and continues to inspire research across Asia. It has led to further projects in India (Pioneering Metallurgy) to explore the origins of *wootz* steel, the raw material of Damascus swords, and collaborations with early iron-working research groups in China and Japan. In Sri Lanka, the work has entered popular culture, with the story of her discoveries being told as a comic book in three languages, and continues to be used to showcase national initiatives in sustainable technologies and renewable resources.

Dr. Gillian Juleff is Associate Professor of Archaeometallurgy and South Asian Archaeology at the University of Exeter. Monsoon Steel characterises her approach, combining assiduous fieldwork and methodological precision in her own field with cross- and multi-disciplinary collaborations to develop understanding beyond archaeology and beyond academic communities. The thesis that underpins her work is that metallurgy and the possession of metallurgical knowhow is one of the central drivers of cultural complexity. It has led her to examine the long-range transmission of technology across Asia (World Archaeology, 2009) and the distorting impact of dominant western scholarship on non-western knowledge systems. In contrast, Gill's long-standing connections with Sri Lanka have taken her back in recent years to work with colleagues at the University of Jaffna in a new collaboration that explores the meaning of identity, place and heritage in post-war communities. Gill's research journey has taken her from objective, evidenced-based archaeology, through multiple international collaborations, to a more reflexive and discursive examination of the past as an agent in shaping the present and future.

### (3) Saturday, 15 February 2025 Speaker: Dr. Chris Bell: *"More than Moore - the future of computing."*

Since the 1960's computer processing power has been continuously improving at a dramatic rate. The transistors at the heart of our computers have gotten smaller, more numerous, and cheaper. Remarkably these changes have been exponential with time. These trends are embodied as "Moore's Law" – which was originally an observation in 1965, but quickly became a roadmap for the semiconductor industry over many decades. However, we are currently in a period where Moore's Law is reaching its limits. This talk will focus on what comes next. The idea of "More than Moore" is the use of new materials, which work in fundamentally different ways to silicon, which we have relied on for many decades. My focus is on devices that operate at low temperatures, which may provide the possibility of creating far more efficient computing.

Chris Bell received his PhD in Device Materials and Physics at Cambridge in 2004. He spent time at the Universities of Leiden (Netherlands), Tokyo (Japan) and Stanford (USA) before taking up a Senior Lecturer position in the School of Physics, University of Bristol, in 2013. He is currently an Associate Professor in the Quantum and Soft Matter research theme, and an experimentalist using thin films and nanofabricated devices to study fundamental solid-state physics.

## (4) Friday, 21 March 2025

Guest Speaker: Professor Nick-Scott Samuel: "Zebras, pandas, triggerfish and starlings: defensive coloration and behaviour on land, in the sea and in the air ".

If you're a potential snack for another species, how can you defend yourself against imminent ingestion? There are both appearances and behaviours that can help. I will talk about recent research that reveals various strategies to avoid being eaten.

Nick Scott-Samuel is Professor of Experimental Psychology at the University of Bristol, and has been investigating camouflage for the last decade or so.