

Speaker: Kaustubh Adhikari (The Open University)

Date: 30/11/2021 at 13:15 in 8 West 2.20

Title: Understanding Ourselves: Applying Statistics to Human Genetics

Abstract:

In recent years, the field of human genetics has grown immensely in terms of data production and analysis, now routinely analysing data from thousands of people over millions of genetic markers and thousands of variables. Consequently, appropriate statistical methods are required to work with such large, multi-dimensional datasets.

In my talk, I will talk about a particular statistical tool called GWAS (genome-wide association study), which have led us to discover the genetic basis of many important human characteristics for the first time. Most genetics studies are conducted on people of European ethnicity, in the UK, USA and Europe, but I had the opportunity of working with a mixed, multi-country cohort of Latin Americans, which allowed us to discover genes unique to other major ethnicities that contribute to the characteristic differences between our appearance. Interestingly, we could also establish statistical signatures of contributions from our long-lost ancestors – the Neanderthals and Denisovan people. Finally, I will talk about my experience of working with a BBC documentary team about the real-life impact of our work.

I will also talk about a few branches of this central theme. I'll discuss some of the modifications of the corpus of GWAS tools that we are proposing. We'll look into a branch of statistics called geometric morphometrics, and see how it is used to model our appearance. And lastly, we'll see some of the medical applications, from pain to cancer.