

# Keynote Abstracts



**Steve Swithenby**

**Day 1 – Keynote I (10.15 in Berrill Lecture Theatre)**

The Open University

## **Functional brain imaging: a window on learning mathematics**

Over the last 40 years physicists, mathematicians, engineers and computer scientists have developed many new ways of studying the living brain. First came structural imaging instruments followed by a new generation of systems that could image brain function. One of the most recently developed of these, magnetoencephalography MEG, is able to image brain activity dynamically and is making an increasingly prominent contribution in unravelling complex cognitive processes.

I will introduce the range of functional imaging methods and ask whether they can shed any useful light on the neurological processes that accompany formal learning activities. On the way, I will question some of the assumptions that are commonly made both in detailed pedagogy and in educational policy.

Recently, I have begun MEG studies of the neurophysiology of algebraic reasoning. I will present pilot data which appears to show startling differences in the brain systems employed by experts and non-experts. These data might offer insights into the ways in which we help students to acquire expertise and may eventually offer diagnostic information at the individual level.



**Steven Rogers**

**Day 1 – Keynote II (15.45 in Berrill Lecture Theatre)**

Office for National Statistics

## **From Data to Perception: Making Numbers Meaningful**

The fundamental role of Official Statistics is to provide important information about life in the United Kingdom. As a vital component of planning and decision-making this information should be accessible, trusted, and understood. However, mediated by complex perceptual processes, portraying meaningful information from a set of data or numbers is not always as simple as one might think. In this presentation, we identify some of the perceptual mechanisms that can effectively ruin even the most honest attempt at providing accurate information. In contrast, we also demonstrate that by understanding perception we can actually improve data presentation and encourage the engagement of a much wider audience.



**Chris Budd**

**Day 2 – Keynote III (14.00 in Berrill Lecture Theatre)**

University of Bath

### **Can we talk maths in public and get away with it?**

Here's the good news. Mathematics is central to all of our lives. It affects all that we do and lies behind all of our modern technology.

It is fun, exciting and one of the key contributions to modern civilisation.

Now the bad news. Very few people realise this, and most of the public think exactly the opposite. Who amongst you has not been embarrassed at a party when they admit they are a mathematician? What other subject has famous people proud to say they cannot do it!

However, it is vital for the health of our subject, both in attracting more young people to study it, and to ensure that it is properly funded, that we get the message across that a world without maths would be a poor world indeed. In this talk I will describe some of the activities that are going on in trying to present maths to the public. What works, what doesn't work and most important of all, why you should do this and how you can get involved.

Be warned this talk will require audience participation!