Programme of Exploring Mathematics, Thursday 28th June 2012

9.30-9.45am | Refreshments and Welcome
9.45-10.30am | Prof. Sean Murphy: Quick quiz session with prizes.
10.30am-11.30am | Rob Eastaway: Ten Ways to Win a Maths Bet in the Pub.
11.30am-11.40am | Break
11.40am-12.40am | Prof. Glyn Harman: Mathematics at University.
12.40am-2.00pm | Lunch, and tours of Campus.
2.00pm-3.00pm | Small group sessions on a variety of topics.
3.00pm-4.00pm | Prof. Kenny Paterson: Cryptography everywhere!.
4.00pm | End.

All events are in the Windsor building -
Main lecture theatre for the morning sessions with the small group sessions running in various other rooms in the same building (tba on the day).

Abstracts of the plenary talks

Rob Eastaway: Ten Ways to Win a Maths Bet in the Pub.

What’s the point of maths? To help you to win bets in the pub of course. The best bets are ones where your opponent thinks the odds are in his favour. Rob demonstrates his favourite examples, ranging from the newspaper bet to ‘special’ poker, and gives the audience a chance to win some money off him too. What better preparation could there be for university life?

Rob Eastaway is the author of numerous books, including the bestselling Why do buses come in threes?, The Hidden Maths of Sport and Maths for Mums and Dads.
He has appeared frequently on BBC Radio 4 and 5Live to talk about the maths of everyday life. He is a former President of the Mathematical Association, and is Director of Maths Inspiration, a national programme of lecture shows for older teenagers.

Prof. Glyn Harman - Mathematics at University.

Are you interested in studying Mathematics at University? This session will deal with the types of course available and the qualifications required, the ways in which university mathematics is different from or similar to that at A level, and the careers available.

Prof. Kenny Paterson - Cryptography everywhere!.

In this talk, Kenny will give a brief introduction to cryptography, the science of secrecy (and more!). He'll explain how cryptography is becoming ubiquitous in the modern world, and talk about how mathematics is used to make and break cryptographic systems.

Kenny is a Professor of Information Security at Royal Holloway and an EPSRC Leadership Fellow. He has a B.Sc. and a Ph.D. in mathematics. He has worked in both academia and industry, applying mathematics to solve real-world problems. More information on Kenny can be found at: www.isg.rhul.ac.uk/ kp
Abstracts of the PROVISIONAL small group sessions

1. **A special session for teachers only!**
   Ms Gill Buque (Regional Coordinator for the South East Further Mathematics Support Programme): Further Maths for Teachers
   This is an informal opportunity for current or potential teachers of Further Maths to share ideas and to find out how the Further Maths Network can support them. It will also provide an opportunity for teachers get together and discuss different aspects of Further Maths teaching.

2. **Dr James McKee: The Mathematics of Doodles.**
   We’ll learn (and play) the game of Sprouts, and explore the mathematics of the resulting doodles.

3. **Dr Benjamin Klopsch: Mathematics under the Leaning Tower of Pisa.**
   Imagine you are seated in a small cafe near the Tower of Pisa in Italy. It is a fine summer day, perfect for mathematical daydreaming. Is it possible to build towers which lean over more seriously? – We will experimentally build such leaning towers and explore the mathematics behind the scene. Not entirely unexpectedly, a cup of strong coffee will save the day.

4. **Dr Keith Mayes: Introduction to Smart Cards.**
   Smart cards are becoming increasingly important in our day today lives. For example they are found in mobile phones, banking cards, identity cards, electronic-tickets etc. Their general capabilities are quite surprising but a most fundamental feature is tamper-resistant security, which is vital as security systems are often subject to a range of sophisticated attacks. The smart card security defences are provided by a mixture of cryptographic and engineering techniques aimed to stay one step ahead of the hackers.

5. **Dr Yiftach Barnea: Counting Infinity.**
   Often people talk about infinity as the “biggest number”. We will explore the idea of infinity as a number. In particular, we will try to see whether infinite objects may have different sizes.

6. **Mr U. Mat, Dr Alexey Koloydenko, room C103: How is doing mathematics in 21st century different from that in “the good old days”?**
   You will have an opportunity to experiment with Matlab, a powerful computer environment which helps us to bridge abstract and concrete. Have in mind a math problem your teacher said could take a century to compute the solution for? See what Matlab thinks about that!

   *(This programme will be updated in the web, closer to the date)*