



## 2014 Colloquia in Combinatorics

The 2013/14 conference followed the successful format established in the past: six invited talks were delivered on each of the two days. The meeting went according to plan, and our expectations were met in full. Most participants attended both days. The conference attracts both excellent speakers and a large audience, with participants coming not only from the UK but also from continental Europe.

The Queen Mary day started with an excellent talk by Peter Keevash who discussed the main ideas behind his proof of the Existence Conjecture for designs. This conjecture had been open since 1853 and its solution surely ranks among the top achievements in the field over the past 10 years. The programme continued with two talks by promising young mathematicians: Vytutas Gruslys talked about orientations of hypergraphs and their applications to Ramsey theory and Ben Barber spoke about partition regular systems of linear equations and its properties. Afterwards, in a very lively lecture, Ehud Friedgut discussed a stability phenomenon in combinatorics and presented a class of problems for which this phenomenon exhibits in a rather different way. The following talk, by



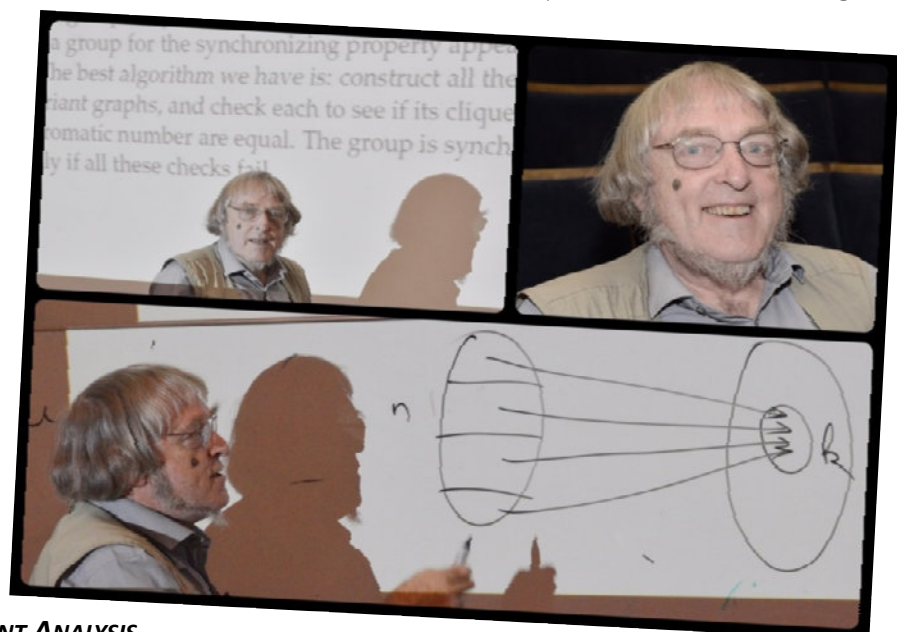
**COLLOQUIA 2014 SPEAKERS**

Konrad Swanepoel, presented the audience with the problem of counting the pairs of points in a subset of Euclidean space that are 'far apart'. The answer depends on the definition of 'being far apart' and Dr Swanepoel surveyed several possible directions and left us with many interesting results and open questions. The programme culminated in a lecture by Miklos Simonovits who explored the stability method in extremal combinatorics from various angles and presented many interesting results and open questions.



#### COLLOQUIA 2014 SPEAKERS

At the LSE day, the first talk was by Paul Wollan about graph minors. In particular, Dr Wollan talked about how to extend the famous work of Robertson and Seymour from graphs to directed graphs. Then, Penny Haxell discussed how certain parameters from topological graph theory have impact on some important questions about matchings in hypergraphs. Later, Pavel Valtr presented various problems related to famous Erdős – Szekeres Theorem in discrete geometry from 1935 and discussed recent progress towards their solution. In the afternoon, Jozsef Balogh gave a beautiful talk about the structure of sum-free sets in which he demonstrated the power of several new techniques, such as the ‘container method’. Then, Diana Piguet spoke about an innovative way to pack bounded-degree trees to complete graphs which, in fact, gives partial solutions to two famous conjectures. The final talk of the day, the traditional Norman Biggs lecture, was delivered by Peter Cameron. In his captivating and well-received talk, Professor Cameron talked about combinatorial problems arising from transformation semigroups, surveyed many results and open problems, and showed some consequences for semi-groups theory.



**NORMAN BIGGS SPEAKER:  
PROFESSOR PETER CAMERON**

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