

2014 Colloquia in Combinatorics

Page Contents > [Two consecutive one-day events hosted by QMUL and LSE](#) |
[A full illustrated report of the event can be read here](#)

Two consecutive one-day events hosted by QMUL and LSE

A full illustrated report of the event can be read [here](#)

Wednesday 14th May 2014

Thursday 15th May 2014



[Ben Barber](#) (Birmingham)

[Ehud Friedgut](#) (Weizmann Institute, Israel)

[Vytautas Gruslys](#) (Cambridge)

[Peter Keevash](#) (Oxford)

[Miklos Simonovits](#) (Hungarian Academy of Sciences)

[Konrad Swanepoel](#) (LSE)

Venue: [Maths Lecture Theatre, Mathematical Sciences Building, QMUL](#)

Timings: the programme will start at 10.30am

Contact: [Robert Johnson \(r.johnson@qmul.ac.uk\)](mailto:r.johnson@qmul.ac.uk)

Wednesday 14th May 2014

Thursday 15th May 2014



THE LONDON SCHOOL
OF ECONOMICS AND
POLITICAL SCIENCE ■

[Jozsef Balogh](#) (University of Szeged and University of Illinois)

[Peter Cameron](#) (St. Andrews)

[Penny Haxell](#) (Waterloo)

[Diana Piquet](#) (Birmingham)

[Pavel Valtr](#) (Charles University)

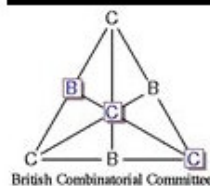
[Paul Wollan](#) (University of Rome "La Sapienza")

Venue: [New Theatre, East Building, LSE](#) (room number: EAS.E171)

Timings: the programme will start at 10.00am

Contact: [Jozef Skokan \(i.skokan@lse.ac.uk\)](mailto:i.skokan@lse.ac.uk)

Supported by



LONDON
MATHEMATICAL
SOCIETY

Report and photos of the event



Downloadable CC2014 poster



To view the speakers and titles please click [here](#).

To view full event programme please click [here](#).

Queries should be sent to [Rebecca Lumb \(r.c.lumb@lse.ac.uk\)](mailto:r.c.lumb@lse.ac.uk).

Those interested are welcome to attend for all or any part of the event. The two hosting institutions are less than half an hour apart by tube; it is hoped that many people will be able to attend for both days. There is no formal registration process and seats will be allocated each day on a first come, first served basis.

Funding

Some funds are available to contribute to the **basic, sensible** travel expenses of UK-based research students who wish to attend the meetings (unfortunately, the terms of our funding do not cover students from overseas). We would ask you to keep costs to a minimum, using public transport booked in advance on **all** occasions and off-peak student travel tariffs wherever possible. Receipts for all journeys must be maintained as proof of travel. At this stage, we are unable to confirm the maximum amount available; once the event has taken place we will reimburse UK-based student expenses, wherever possible, on a case-by-case basis. Official expense claim forms will be available to collect at the event. Please contact [Rebecca Lumb](#) for further information.

There are also some funds available from the London Mathematical Society for help with childcare costs. Further details can be found at <http://www.lms.ac.uk/content/childcare-supplementary-grants>.

Event Support

Support for this event by the [London Mathematical Society](#) and the [British Combinatorial Committee](#) is gratefully acknowledged by the organisers.

Event Poster

A poster advertising both days of the event is available to download [here](#). Please do feel free to electronically distribute this to anyone who might be interested, append to local websites (linking back to this site using the URL <http://tiny.cc/Colloquia>) or print out to share on public notice boards.

Two One-Day Colloquia in Combinatorics

14-15 May 2014 – London

<http://tiny.cc/Colloquia>



Wednesday 14 May 2014

The first day of the Colloquia in Combinatorics will be held at Queen Mary, University of London on Wednesday 14 May, starting at 10.30am. **Coffee is available from 10.00 am in the Maths Building Foyer.** Everyone interested is welcome to attend any part of the event. All the talks will be held in the Maths Lecture Theatre, Mathematical Sciences Building, Mile End Campus, QMUL.

Time	Speaker	Presentation title
10:30	Peter Keevash (Oxford)	The existence of designs
11:20	Vytautas Gruslys (Cambridge)	Orientations of hypergraphs and sparse Ramsey theory
13:30	Ben Barber (Birmingham)	Partition regularity and the columns property
14:20	Ehud Friedgut (Weizmann Institute)	Combinatorial problems in the symmetric group, stability and quasi-stability
15:40	Konrad Swanepoel (LSE)	Counting double-normal pairs in Euclidean space
16:30	Miklós Simonovits (Hungarian Academy of Sciences)	Stability methods, supersaturated graphs, phase transitions



Thursday 15 May 2014

The second day of the Colloquia in Combinatorics will be held at The London School of Economics and Political Science on Thursday 15 May, starting at 10.00am. Everyone interested is welcome to attend any part of the event. The talks will be held in the New Theatre (room number: EAS.E171).East Building, LSE.

Time	Speaker	Presentation title
10:00	Paul Wollan (Rome)	When are directed graphs well-quasi-ordered under taking minors
11:20	Penny Haxell (Waterloo)	Extremal graphs for connectedness
12:10	Pavel Valtr (Prague)	Happy ending theorem and some related questions and results
14:20	József Balogh (Szeged and UIUC)	On the typical structure of sum-free sets
15:40	Diana Piguet (Birmingham)	An approximate version of the tree packing conjecture for bounded degree graphs
16:30	Peter Cameron (St. Andrews)	THE NORMAN BIGGS LECTURE: Combinatorial problems from transformation semigroups

All interested parties are welcome to attend; there is **no formal registration process and seats will be allocated each day on a first come, first served basis.**

Support for this event from the **London Mathematical Society** and the **British Combinatorial Committee** is gratefully acknowledged by the organisers.



THE LONDON SCHOOL
OF ECONOMICS AND
POLITICAL SCIENCE ■



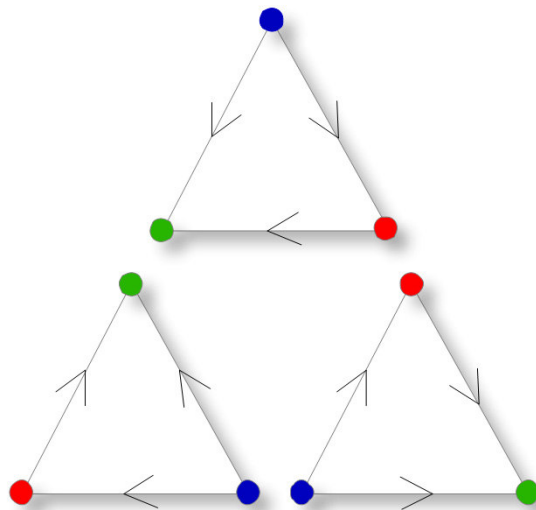
Queen Mary
University of London

Queen Mary, University of London

**The London School of Economics
and Political Science**

Two One-Day Colloquia in Combinatorics

14th and 15th May 2014



If attending both days, please keep this programme for day two

CONTENTS

Page	
4	Wednesday 14th May – QMUL schedule
5	Wednesday 14th May – QMUL abstracts
8	Places to eat at QMUL and area map
9	QMUL Mile End Campus map
10	Thursday 15th May – LSE schedule
11	Thursday 15th May – LSE abstracts
14	Places to eat at LSE and area map
15	LSE Campus map

INFORMATION

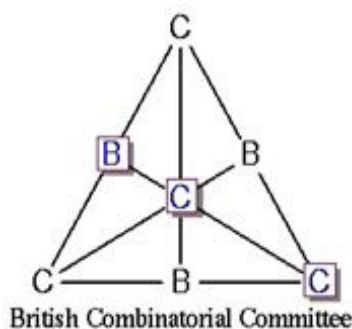
Those interested are welcome to attend for all or any part of the event; it is hoped that many people will be able to attend for both days.

Some funds are available to contribute to the **basic** travel expenses of **research students** who attend the meetings. We ask you to keep costs to a minimum, using public transport on **all** occasions and off-peak student travel tariffs wherever possible. Receipts for all journeys must be maintained as proof of travel. At this stage, we are unable to confirm the maximum amount available. Expense claim forms are available at the event from the event organisers. Please contact Rebecca Lumb (r.c.lumb@lse.ac.uk) for further information.

Event organisers: Dr Robert Johnson (QMUL) and Dr Jozef Skokan (LSE).

SUPPORT

Support for this event from the London Mathematical Society (www.lms.ac.uk) and the British Combinatorial Committee (www.maths.qmul.ac.uk/~pjc/bcc) is gratefully acknowledged.



LONDON
MATHEMATICAL
SOCIETY

WEDNESDAY 14th MAY 2014

Schedule

The first day of the Colloquia in Combinatorics will be held at Queen Mary, University of London on Wednesday 14th May, starting at 10.30am. Everyone interested is welcome to attend any part of the event. All the talks will be held in the Maths Lecture Theatre, Mathematical Sciences Building, Mile End Campus, QMUL.

Time	Speaker	Presentation title
10:00	Coffee (<i>Maths Building Foyer</i>)	
10:30	Peter Keevash (Oxford)	The existence of designs
11:20	Vytautas Gruslys (Cambridge)	Orientations of hypergraphs and sparse Ramsey theory
12:10	Lunch (<i>own arrangements – options on campus and nearby</i>)	
13:30	Ben Barber (Birmingham)	Partition regularity and the columns property
14:20	Ehud Friedgut (Weizmann Institute)	Combinatorial problems in the symmetric group, stability and quasi-stability
15:10	Afternoon tea break (<i>Maths Building Foyer</i>)	
15:40	Konrad Swanepoel (LSE)	Counting double-normal pairs in Euclidean space
16:30	Miklós Simonovits (Hungarian Academy of Sciences)	Stability methods, supersaturated graphs, phase transitions
17:20	End	

The existence of designs

Peter Keevash

A Steiner Triple System on a set X is a collection T of 3-element subsets of X such that every pair of elements of X is contained in exactly one of the triples in T . An example considered by Plücker in 1835 is the affine plane of order three, which consists of 12 triples on a set of 9 points. Plücker observed that a necessary condition for the existence of a Steiner Triple System on a set with n elements is that n be congruent to 1 or 3 mod 6. In 1846, Kirkman showed that this necessary condition is also sufficient. In 1853, Steiner posed the natural generalisation of the question: given q and r , for which n is it possible to choose a collection Q of q -element subsets of an n -element set X such that any r elements of X are contained in exactly one of the sets in Q ? There are some natural necessary divisibility conditions generalising the necessary conditions for Steiner Triple Systems. The Existence Conjecture states that for all but finitely many n these divisibility conditions are also sufficient for the existence of general Steiner systems (and more generally designs). We prove the Existence Conjecture, and more generally, we show that the natural divisibility conditions are sufficient for clique decompositions of simplicial complexes that satisfy a certain pseudorandomness condition.

Orientations of hypergraphs and sparse Ramsey theory

Vytautas Gruslys

Let G be an r -uniform hypergraph. When is it possible to orient the edges of G in such a way that every p -set of vertices has some p -degree equal to 0? (The p -degrees generalise for sets of vertices what in-degree and out-degree are for single vertices in directed graphs.) Caro and Hansberg asked if the obvious Hall-type necessary condition is also sufficient.

Our main aim is to show that this is true for r large (for given p), but false in general. Our counterexample is based on a new technique in sparse Ramsey theory that may be of independent interest.

Partition regularity and the columns property

Ben Barber

A system of linear equations with integer coefficients is partition regular if, whenever the natural numbers are finitely coloured, it has a monochromatic solution. In 1933 Rado showed that a finite system of equations is partition regular if and only if its matrix of coefficients has the "columns property".

It is easy to write down infinite systems which have the columns property but are not partition regular. However, all known examples of infinite partition regular systems do have the columns property. Must all infinite partition regular systems have the columns property?

Combinatorial problems in the symmetric group, stability and quasi-stability

Ehud Friedgut

Many problems in extremal combinatorics exhibit a "stability" phenomenon: solutions that are close to achieving the extremum, must also be close in structure to the true extremal examples (e.g. the extremal solutions in the Erdős-Ko-Rado theorem, or isoperimetric extrema in the Boolean cube).

In this talk I will present some combinatorial problems set in the symmetric group for which such a stability phenomenon exists, but also other problems where one can construct near-extremal examples by taking a union of truly extremal sets, what we coin as quasi-stability.

Pleasingly enough, this is mirrored (or rather, encoded) by algebraic phenomena which arise naturally when one attempts to solve these problems using representation theoretic tools, as we do.

I will attempt to describe these phenomena, but will avoid diving too deeply into representation theory, as there is a nice translation of the above into a simpler language.

This is joint work with David Ellis, Yuval Filmus, and Haran Pilpel.

Counting double-normal pairs in Euclidean space

Konrad Swanepoel

Given a set of n points in Euclidean space, there are various ways of declaring two points to be "far apart". Two well-known notions are *diameter pairs*, where the distance between the points equals the diameter of the set, and *antipodal pairs*, where there are parallel hyperplanes through the two points such that the whole set is contained in the closed slab bounded by the hyperplanes. Martini and Soltan (2006) introduced the notion of a *double-normal pair* of points, where we ask in addition to antipodality that the parallel hyperplanes are perpendicular to the line joining the two points. This very natural notion lies between that of diameter pair and antipodal pair.

We survey the problems of determining the maximum number of diameters, antipodal pairs, or double-normal pairs in a set of n points in Euclidean space. While the problem for diameters is well understood, and the problem for antipodal pairs seemingly difficult, it seems that nothing has been done before for double-normal pairs. We present asymptotically exact results in dimension 3 and some partial results in higher dimensions.

This is joint work with János Pach (Lausanne and Budapest).

Stability methods, supersaturated graphs, phase transitions

Miklós Simonovits

In the lecture I will concentrate on three strongly connected problems: Stability phenomena in extremal graph theory, supersaturated graphs and phase transitions.

The stability means that we have a family of forbidden graphs (hypergraphs) and consider graphs not containing some forbidden subgraphs, increasing the edge-number slowly, and as soon as we almost reach the maximum (extremum), the structures of the considered graphs become very similar. Next we go above the maximum and suddenly very many forbidden graphs emerge in the considered graphs: this is the phase transition.

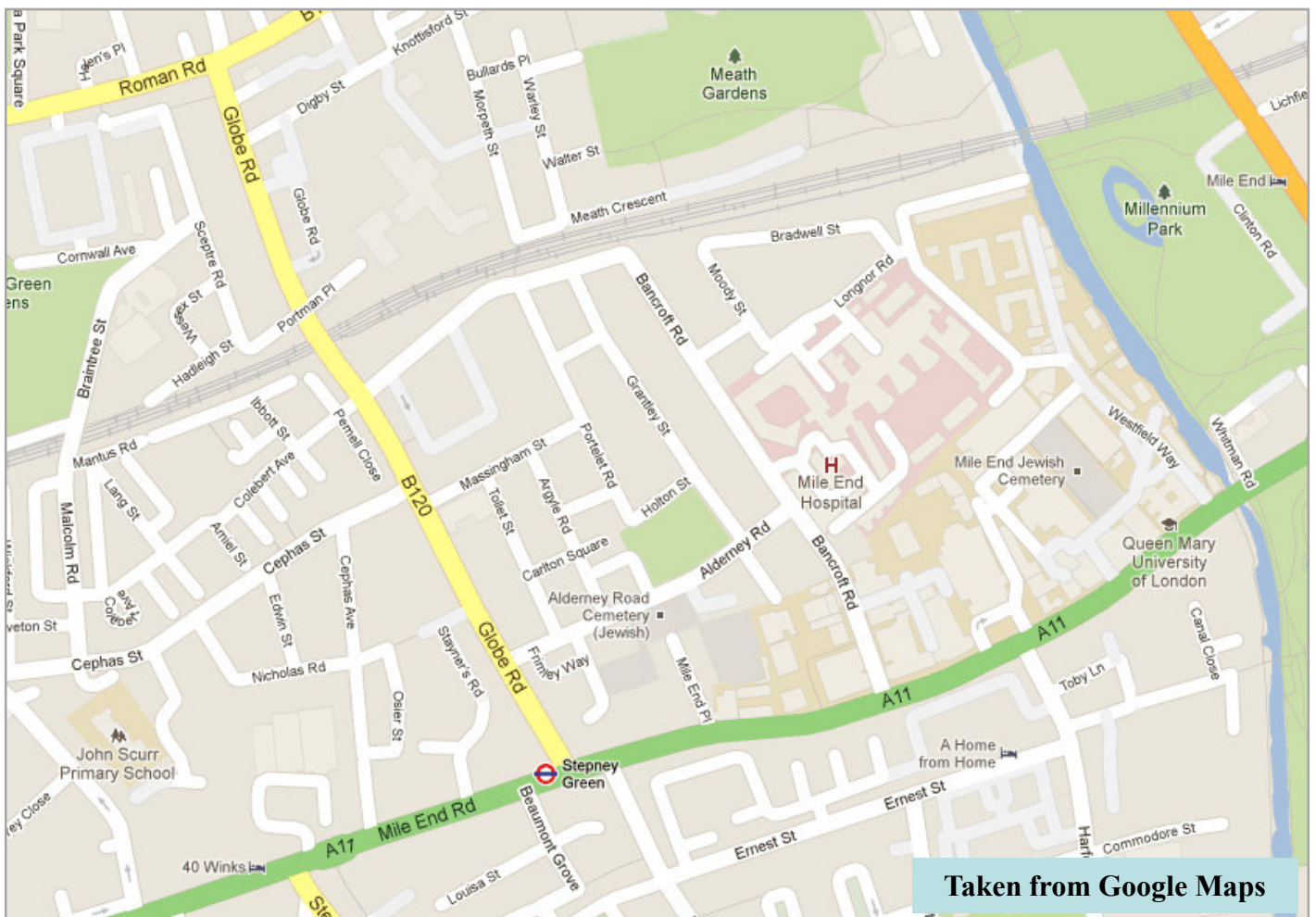
Such questions can be considered in several settings: graph problems, digraph problems, hypergraph problems, Ramsey-Turán type problems.

We can increase the number of edges and obtain this way fairly complicated problems.

We shall consider related phenomena and also several related open questions.

PLACES TO EAT: in and around QMUL

- Drapers Bar and Kitchen – wide range to suit all dietary requirements, Bancroft Road
- Drunken Monkey – Asian fusion, Westfield Way
- Greedy Cow – gastropub food, Grove Road
- Half Moon Pub – Wetherspoons serving standard pub food, Mile End Road
- Matsu – Japanese food, Mile End Road
- Morgan Arms – Up-market pub food, Morgan Street
- Mucci's – Italian trattoria, Library Square
- Nandos – Portuguese Chicken, Mile End Road
- Pride of Asia – Bangladeshi restaurant with all-you-can-eat buffet, Mile End Road
- The Curve – international food to eat-in or take away, Westfield Way
- The Jasmine Kitchen – railway arch café serving Thai food, White Church Lane



Mile End Campus Map

Educational/Research

ArtsOne	37
ArtsTwo	35
Arts Research Centre	39
The Bancroft Building	31
Bancroft Road Teaching Rooms	10
Computer Science	6
Engineering Building	15
Fogg Building	13
G.O. Jones Building	25
Geography	26
IRC	14
Informatics Teaching Laboratories	5
Joseph Priestley Building	41
Library	32
Law	36
Lock-keeper's Graduate Centre	42
Mathematical Sciences	4
Occupational Health and Safety Directorate	12
The People's Palace/Great Hall	16
Queens' Building	19
Temporary Building	61

Residential

Albert Stern Cottages	3
Albert Stern House	1
Beaumont Court	53
Chapman House	43
Chesney House	45
Creed Court	57
France House	55
Feilden House	46
Hatton House	40
Ifor Evans Place	2
Lindop House	21
Lodge House	50
Lynden House	59
Maurice Court	58
Maynard House	44
Pooley House	60
Selincourt House	51
Varey House	49

Facilities

Advice and Counselling Service	27
Blomeley Centre	48
Bookshop	22
Careers Centre	19
Clock Tower	20
CopyShop	56
The Curve	47
Drapers' Bar and Kitchen	8
Drunken Monkey	63
Ground Café	33
The Hive	24
Infusion	9
IT Services	19
London Chamber Orchestra	64
Mucci's	29
Occupational Health Service/ Student Health Service	28
Octagon	19a
Police Box	38
Post Room	17
QMotion Fitness Centre	7
Sports Hall	7
Residences Reception	54
Santander Bank	62
Security	18
St Benet's Chaplaincy	23
Student Centre/Hub	34
Village Shop	52
Westfield Nursery	11

Information

Visitors who require further information or assistance please go to the Main Reception in the Queens' Building.

Please do not smoke on the campus.

These premises are alarmed and monitored by CCTV, please call Security on 020 7882 5000 for more information.

Library/bookshop

Fitness centre

Bar

Coffee place

Eatery

Staff car park

Bicycle parking

Bicycle lockers

Cash machine





THURSDAY 15th MAY 2014

Schedule

The second day of the Colloquia in Combinatorics will be held at The London School of Economics and Political Science on Thursday 15th May, starting at 10.00am. Everyone interested is welcome to attend any part of the event. The talks will be held in the New Theatre (room number: EAS.E171), East Building, LSE; refreshments breaks will be taken in EAS.E168, East Building, LSE; reception will be held in the Senior Common Room, Fifth Floor Old Building, LSE.

Time	Speaker	Presentation title
10:00	Paul Wollan (Rome)	When are directed graphs well-quasi-ordered under taking minors
10:50	Coffee break (<i>room EAS.E168</i>)	
11:20	Penny Haxell (Waterloo)	Extremal graphs for connectedness
12:10	Pavel Valtr (Prague)	Happy ending theorem and some related questions and results
13:00	Lunch (<i>own arrangements – options on campus and nearby</i>)	
14:20	József Balogh (Szeged and UIUC)	On the typical structure of sum-free sets
15:10	Afternoon tea break (<i>room EAS.E168</i>)	
15:40	Diana Piguet (Birmingham)	An approximate version of the tree packing conjecture for bounded degree graphs
16:30	Peter Cameron (St. Andrews)	THE NORMAN BIGGS LECTURE: Combinatorial problems from transformation semigroups
17:30	Reception (<i>Senior Common Room, Fifth Floor Old Building</i>)	

When are directed graphs well-quasi-ordered under taking minors

Paul Wollan

A containment relation \preceq on graphs is a *well-quasi-order* if for every infinite sequence of graphs G_1, G_2, G_3, \dots there exists indices $i, j, i < j$, such that $G_i \preceq G_j$. Many natural models of graph containment such as subgraph or topological minor are not well-quasi-orders, and it is easy to construct infinite antichains of graphs which show this. Wagner conjectured, however, that graphs are well quasi-ordered under graph minors and this was confirmed by Robertson and Seymour in their famous Graph Minors series of papers.

If we consider directed graphs, there is a natural example of an infinite antichain of graphs under containment as a *directed minor*, implying that directed graphs are not well-quasi-ordered under directed minors. In this talk, we will discuss recent work which shows that this antichain is in a certain sense unique, and if a subset of digraphs avoids the antichain, then it is well-quasi ordered under directed minors. The end result is an exact characterization of directed minor ideals which are well-quasi-ordered under directed minors.

Extremal graphs for connectedness

Penny Haxell

It is known that the topological connectedness of the independence complex of a line graph $L(G)$ is bounded below by $\nu(G)/2 - 2$, where $\nu(G)$ denotes the matching number of G . This graph parameter turns out to be important in the study of hypergraph matchings. We classify the bipartite graphs G for which this parameter attains the value $\nu(G)/2 - 2$, and describe the consequences of our work for some long-standing conjectures about hypergraphs.

This is joint work with Lothar Narins and Tibor Szabó.

Happy ending theorem and some related questions and results

Pavel Valtr

The Erdős–Szekeres k -gon theorem (1935), sometimes called Happy ending theorem, says that for any integer $k \geq 3$ there is an integer $n(k)$ such that any set of $n(k)$ points in the plane, no three on a line, contains k points which are vertices of a convex k -gon. It is a classical result both in combinatorial geometry and in Ramsey theory.

We shall discuss various results and open problems related to the Erdős–Szekeres theorem. For example, it is still widely open if the minimum possible value of $n(k)$ is equal to $2^{k-2} + 1$, as conjectured by Erdős and Szekeres more than fifty years ago. Some recent results related to the Erdős–Szekeres theorem are purely combinatorial, dealing with colored (hyper)graphs on linearly ordered vertex sets.

On the typical structure of sum-free sets

József Balogh

First we study sum-free subsets of the set $\{1, \dots, n\}$, that is, subsets of the first n positive integers which contain no solution to the equation $x + y = z$. Cameron and Erdős conjectured in 1990 that the number of such sets is $O(2^{n/2})$. This conjecture was confirmed by Green and, independently, by Sapozhenko. We prove a refined version of their theorem, by showing that the number of sum-free subsets of $[n]$ of size m is $2^{O(n/m)} \binom{\lceil n/2 \rceil}{m}$, for every $1 \leq m \leq \lceil n/2 \rceil$. For $m \geq \sqrt{n}$, this result is sharp up to the constant implicit in the $O(\cdot)$. Our proof uses a general bound on the number of independent sets of size m in 3-uniform hypergraphs, proved recently by the authors, and new bounds on the number of integer partitions with small sumset.

Then we study sum-free sets of order m in finite Abelian groups. We determine the typical structure and asymptotic number of sum-free sets of order m in Abelian groups G whose order n is divisible by a prime q with $q \equiv 2 \pmod{3}$, for every $m \geq C(q)\sqrt{n \log n}$, thus extending and refining a theorem of Green and Ruzsa. In particular, we prove that almost all sum-free subsets of size m are contained in a maximum-size sum-free subset of G .

Finally, we explain connection with recent "independent sets in hypergraph" general theorems, and describing typical structure of graphs.

In the talk I try to have different approach from other talks on "independent sets in hypergraph" general theorems

The talk is based on joint results with Noga Alon, Rob Morris, Wojciech Samotij and Lutz Warnke.

An approximate version of the tree packing conjecture for bounded degree graphs

Diana Piguet

A family of graphs packs into a graph G if there exist pairwise edge-disjoint copies of its members in G . We prove a theorem about packing trees into a complete graph. The result implies asymptotic versions of the Tree Packing Conjecture of Gyárfás and the Ringel Conjecture for the class of trees with bounded maximal degree. The core of the proof is a random process controlled by the nibbling method.

This is joint work with Julia Böttcher, Jan Hladký, and Anusch Taraz.

“The Norman Biggs Lecture”

Combinatorial problems from transformation semigroups

Peter Cameron

The study of finite transformation semigroups leads to many problems in combinatorics and permutation groups which have not been very much considered. The problems resemble design theory, but rather than concerning subsets of a finite set of two cardinalities, they tend to involve subsets and partitions of the same cardinality. The key fact is that if two transformations have the same rank, then their product also has the same rank if and only if the image of the first is a transversal for the kernel of the second. We are led to consider such problems as: what are the largest (in a suitable sense) sets of subsets and partitions so that no subset is a transversal for any of the partitions ? What is the smallest set of subsets which contains a transversal for every partition ? Which permutation groups have the property that some orbit on subsets contains a transversal for every partition ? I will survey some results and open problems, and some consequences for semigroup theory.



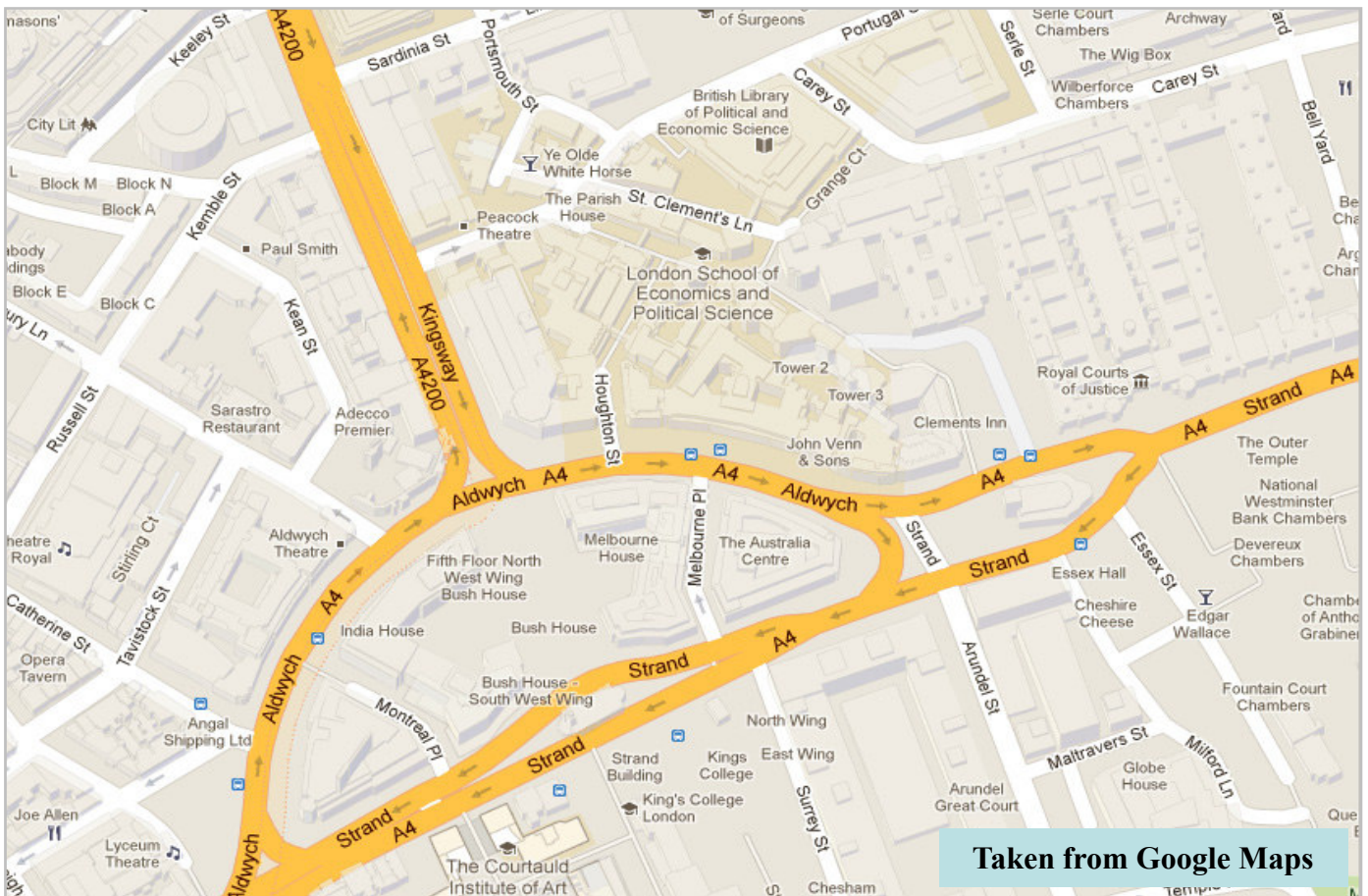
PLACES TO EAT: in and around LSE

Close by:

All Bar One - Kingsway
Belgo - Kingsway
Café Amici - Kingsway
Café Nero - Kingsway
Costa - Kingsway
EAT - Kingsway
Hot - Kingsway
Paul - Kingsway
Pret a Manger - Kingsway
Sainsburys - Kingsway
Starbucks - Kingsway
Subway - Kingsway
The Delaunay - Aldwych
Wasabi - Kingsway

On campus:

Café 54 - Mezzanine floor, New Academic Building
Daily Grind coffee shop - Tower One reception
Fourth Floor Café Bar - Old Building
Fourth Floor Restaurant - Old Building
George IV pub - Portugal Street
LSE Garrick - Ground floor, Columbia House
Plaza Café - John Watkins Plaza
Three Tuns Bar - Ground floor, East Building

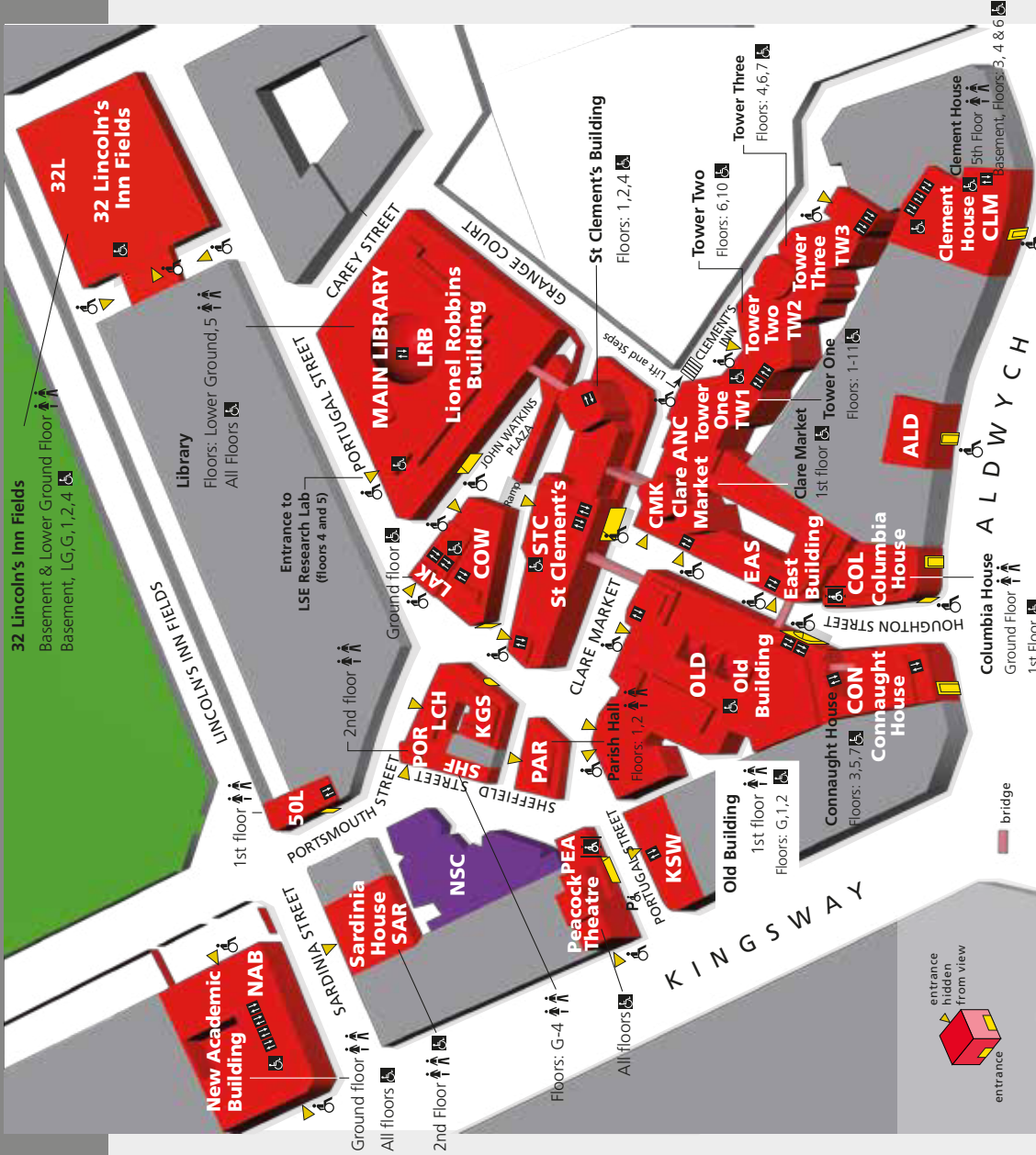


Disabled access information

-  Disabled lift
-  Disabled parking
-  Toilets for wheelchair user
-  Lift
-  Unisex toilets
-  disabled access

Disabled access

Portable ramp for 20 Kingsway (KSW only) is located in entrance foyer. Please call 020 7955 6200 for Security staff to set up the ramp on request. After 6.30pm, please call Security Control on 020 7955 6200 to ensure that any disabled access doors are open.



ALD	Aldwych House Aldwych
ANC	The Anchorage
CMK	Clare Market Houghton Street
CKM	Clement House Aldwych
COL	Columbia House Aldwych
CON	Connaught House Aldwych
COW	Cowdray House Portugal Street
EAS	East Building Houghton Street

KGS	King's Chambers Portugal Street
KSW	20 Kingsway
50L	50 Lincolns Inn Fields Portsmouth Street
32L	32 Lincolns Inn Fields
LCH	Lincoln Chambers Portsmouth Street
LAK	Lakatos Building Portugal Street
LRB	Lionel Robbins Building, Library and LSE Research Lab
NAB	New Academic Building Lincolns Inn Fields

NSC	New Students' Centre Development Sheffield Street
OLD	Old Building Houghton Street
PAR	Parish Hall Sheffield Street
PEA	Peacock Theatre Portugal Street
POR	1 Portsmouth Street
SAR	Sardinia House Sardinia Street

- Student Services Centre**
Ground floor, Old Building
- Graham Wallis Room**
OLD 5.25, Old Building
- Hong Kong Theatre**
Ground floor, Clement House
- New Theatre** EAS E171, East Building
- Old Theatre**
Ground floor, Old Building
- Shaw Library** Sixth floor, Old Building
- Sheikh Zayed Theatre**
New Academic Building
- Thai Theatre** New Academic Building
- The Wolfson Theatre**
New Academic Building
- Vera Anstey Room**
Between ground and first floor, Old Building
- 3 Tuns**
Ground floor, Clare Market St
- Café 54**
Ground floor, New Academic Building
- Daily Grind** Tower 1/2 Reception
- Fourth Floor Café Bar** Old Building
- Fourth Floor Restaurant**
Old Building
- George IV pub** Between LCH and KGS, Portugal Street
- LSE Garrick** Ground floor, Columbia House
- Mezzanine Café** New Academic Building
- Plaza Café** John Watkins Plaza
- Senior Common Room and Dining Room** Fifth floor, Old Building
- Student Common Room**
Ground floor, King's Chambers

SHF	Sheffield Street
STC	St Clement's Clare Market
TW1	Tower One Clement's Inn
TW2	Tower Two Clement's Inn
TW3	Tower Three Clement's Inn



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: Vytautas 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



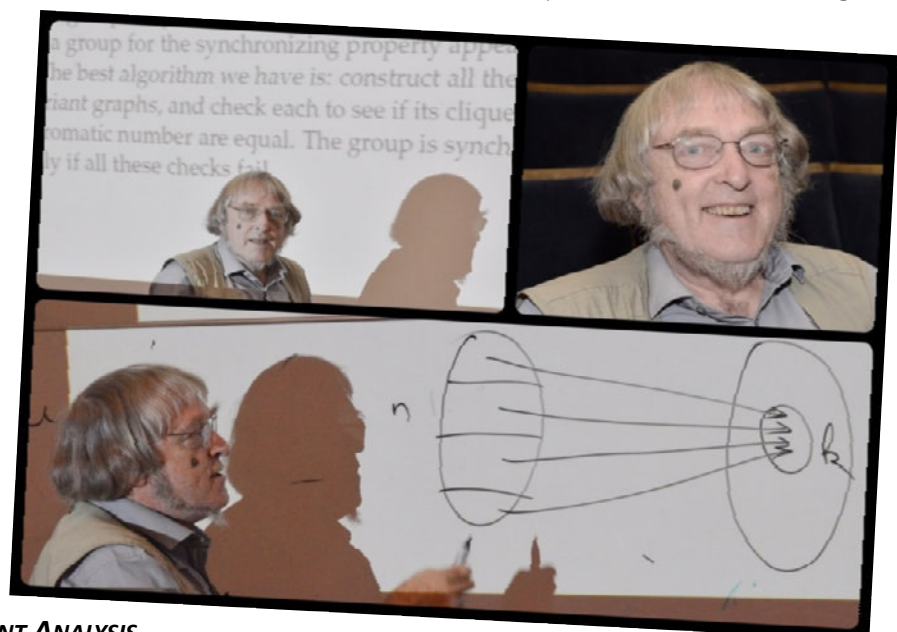
COLLOQUIA 2014 SPEAKERS

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**

**PHOTOGRAPHS COURTESY OF EVENT ANALYSIS
LTD, c/o PETER WREN**

