Dr Katherine Staden **Curriculum Vitae**

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RESEARCH INTERESTS

Extremal combinatorics, including stability, Ramsey theory, expansion, Hamilton cycle problems, combinatorial number theory.

EMPLOYMENT

University of Oxford, Oxford, UK

Postdoctoral Research Assistant, January 2018 –

- Working with Peter Keevash, funded by the ERC grant 'Combinatorial Construction'.

University of Warwick, Coventry, UK

Research Fellow, February 2015 – December 2017

- Working with Oleg Pikhurko, funded by the ERC grant 'Extremal Combinatorics'.

EDUCATION

University of Birmingham, Birmingham, UK

Ph.D., Mathematics, September 2011 – December 2014

- Supervised by Deryk Osthus and co-supervised by Daniela Kühn.
- Thesis title: 'Robust expansion and Hamiltonicity'.

Trinity Hall, **University of Cambridge**, Cambridge, UK

M.Math. (Part III), October 2010 – June 2011

- Honours pass with Distinction.

B.A. Mathematics, October 2007 – June 2010

PUBLICATIONS AND PREPRINTS

11. H. Liu, O. Pikhurko and K. Staden,
The minimum number of triangles in a graph of given order and size,
submitted (99 pages).
(Extended abstract accepted to Eurocomb 2017).

10. O. Chervak, O. Pikhurko and K. Staden,
Minimum number of additive tuples in groups of prime order,
submitted (14 pages).

9. H. Liu, M. Sharifzadeh and K. Staden,
On the maximum number of integer colourings with forbidden monochromatic sums,
submitted (24 pages).

8. R. Hancock, K. Staden and A. Treglown,
Independent sets in hypergraphs and Ramsey properties of graphs and the integers,
submitted (32 pages).

7. J. Kim, H. Liu, M. Sharifzadeh and K. Staden,
Proof of Komlós's conjecture on Hamiltonian subsets,
to appear in *Proc. London Math. Soc.* (33 pages).
(Extended abstract accepted to Eurocomb 2017).

6. H. Liu, M. Sharifzadeh and K. Staden,
Local conditions for exponentially many subdivisions,
Combin. Prob. Comput. (7 pages).

5. O. Pikhurko, K. Staden and Z. B. Yilma,
The Erdős-Rothschild problem on edge-colourings with forbidden monochromatic cliques,
Math. Proc. Cambridge Phil. Soc. (16 pages).

4. K. Staden and A. Treglown,
On degree sequences forcing the square of a Hamilton cycle,
SIAM J. Discrete. Math. (50 pages)
(Extended abstract accepted to Eurocomb 2015).

3. D. Kühn, S. A. Lo, D. Osthus and K. Staden,
Solution to a problem of Bollobás and Häggkvist on Hamilton cycles in regular graphs,
J. Combin. Theory B. **121** (Special issue, 'Fifty Years of the Journal of Combinatorial Theory') (2016), 85–145. (61 pages)

2. D. Kühn, S. A. Lo, D. Osthus and K. Staden,
The robust component structure of dense regular graphs and applications,
Proc. London Math. Soc. **110** (1) (2015), 19–56. (38 pages)
(Extended abstract accepted to Eurocomb 2013).

1. D. Osthus and K. Staden,
Approximate Hamilton decompositions of robustly expanding regular digraphs,
SIAM J. Discrete Math., **27** (3), 1372–1409. (38 pages)

Conference and seminar talks

Proof of Komlós's conjecture on Hamiltonian subsets
Novi Sad Workshop on Foundations of Computer Science, University of Novi Sad, July 2017

The minimum number of triangles in a graph with a given number of edges and vertices
Seminar on Combinatorics, Games and Optimisation, LSE, February 2018 (invited)
Combinatorics seminar, University of Birmingham, February 2018 (invited)
Combinatorial theory seminar, University of Oxford, January 2018
Eurocomb, Vienna, August 2017
Combinatorics seminar, University of Cambridge, May 2017 (invited)
Pure and Applied Mathematics Colloquium, Open University, January 2017 (invited)
Combinatorics seminar, University of Warwick, November 2016

The Erdős-Rothschild problem on edge-colourings with forbidden monochromatic cliques
Combinatorics seminar, Freie Universität, Berlin, May 2016 (invited)
Young Mathematicians' Colloquium, University of Birmingham, April 2016 (invited)
British Mathematical Colloquium (short talk), University of Bristol, March 2016

On degree sequences forcing the square of a Hamilton cycle
Eurocomb, Bergen, September 2015
British Combinatorial Conference, University of Warwick, July 2015.
University of Bristol combinatorics seminar, March 2015 (invited)
Polish Combinatorial Conference, Bedlęwo, September 2014

The robust component stucture of dense regular graphs
RSA, Poznań, August 2013
Eurocomb, Pisa, September 2013

Approximate Hamilton decompositions of robustly expanding digraphs
Postgraduate Combinatorial Conference, University of Warwick, August 2012
Polish Combinatorial Conference, Bedlęwo, September 2012

Selected conferences and events

Workshop, *Algorithms, Logic and Structure*, University of Warwick, December 2016.
Workshop, *Probabilistic and Extremal Combinatorics*, University of Birmingham, September 2015.
LMS/EMS Joint Anniversary Mathematical Weekend, University of Birmingham, September 2015.
Workshop, *Non-Combinatorial Combinatorics*, University of Warwick, September 2015.
British Combinatorial conference, University of Warwick, July 2015 LMS-CMI research school, *Regularity and analytic methods in combinatorics*, University of Warwick, July 2015.
Summer school, *Graph limits, groups and stochastic processes*, Rényi Institute, Budapest, June 2014.
LMS short course, *Random graphs, geometry and asymptotic structure*, University of Birmingham, August 2013.
Béla Bollobás's 70^{th} birthday conference, Cambridge, August 2013.
School on graph theory, *Recent advances in the theory of directed graphs*, Oléron, June 2013.
Workshop on probabilistic methods in graph theory, University of Birmingham, April 2012.
MDS block course, *Extremal combinatorics in random discrete structures*, March 2012.

Teaching Experience

Fourth year project supervisor for Josh Brown (*The container method*) and Henry Dai (*Discharging in graphs*); fourth year project examiner for George Witty (*Induced Ramsey numbers*), all at the University of Warwick.

Examiner for fourth year *Maths-in-Action* projects (*The mathematics of voting*) at the University of Warwick.

Demonstrator and marker for *Combinatorics*, *Graph Theory* and *Communication Theory*, all third/fourth year courses at the University of Birmingham.

Small group teaching for an introductory first year course *Foundation and Abstraction* on elementary number theory and analysis, University of Birmingham.

Grants

LMS conference grant for *Conference on Extremal Combinatorics*, University of Warwick, September 2017.

Professional Service

Co-organiser of *Conference on Extremal Combinatorics*, University of Warwick, September 2017 (with Oleg Pikhurko).

Referee for Discrete Mathematics, Journal of Graph Theory, Random Structures and Algorithms.