

Ewan Davies

Positions

University of Colorado at Boulder Postdoc in the CS Theory group of Prof. Alexandra Kolla	Boulder, Colorado, USA October 2019 – Current
Simons Institute for the Theory of Computing Research Fellow at <i>Geometry of Polynomials</i> program	Berkeley, California, USA January 2019 – May 2019
University of Amsterdam (UvA) Postdoc in the <i>AFMIDMOA</i> group of Prof. Lex Schrijver	Amsterdam, Netherlands October 2017 – December 2018

Education

London School of Economics and Political Science (LSE) Ph.D. Mathematics Thesis title: <i>Extremal and probabilistic results for regular graphs</i> Supervisors: Prof. Jozef Skokan, Dr. Peter Allen	London, UK October 2013 – September 2017
Jesus College, University of Cambridge M.Math. Mathematics, Distinction B.A. (Hons) Mathematics, First Class	Cambridge, UK September 2012 – June 2013 September 2009 – June 2012

Research Interests

Extremal and probabilistic combinatorics, graph theory, approximation algorithms, statistical physics, hypergraphs, Ramsey theory

Awards

2020	Jul	PhD Prize for Outstanding Academic Performance , London School of Economics
2016	Jan	Santander Scholarship , Santander Travel Research Fund at LSE
2015	Oct	Cyril Offord Trust Award , London School of Economics
2014	Jul	Mathematics Department New Teacher Prize , London School of Economics
2013	Sep	Ph.D. Studentship , London School of Economics
	Jun	Foundation Scholarship and R.A. Watchman Prize , Jesus College, Cambridge <i>for top results in Part III Mathematics examinations</i>
2012	Jun	Foundation Scholarship and Sir Harold Spencer Jones Prize , Jesus College, Cambridge <i>for top results in Part II Mathematics examinations</i>
2011	Jun	Foundation Scholarship and Ware Prize , Jesus College, Cambridge <i>for top results in Part IB Mathematics examinations</i>
2010	Jun	Foundation Exhibition and Bronowski Prize , Jesus College, Cambridge <i>for top results in Part IA Mathematics examinations</i>

Papers

Submitted

- [16] C. Carlson, E. Davies, and A. Kolla. Efficient algorithms for the Potts model on small-set expanders (2020). arXiv: [2003.01154](https://arxiv.org/abs/2003.01154).

- [15] M. Coulson, E. Davies, A. Kolla, V. Patel, and G. Regts. Statistical physics approaches to Unique Games (2019). arXiv: [1911.01504](https://arxiv.org/abs/1911.01504).
- [14] P. Allen, E. Davies, and J. Skokan. Regularity inheritance in hypergraphs (2019). arXiv: [1901.05955](https://arxiv.org/abs/1901.05955).
- [13] E. Davies, R. de Joannis de Verclos, R. J. Kang, and F. Pirot. Occupancy fraction, fractional colouring, and triangle fraction (2018). arXiv: [1812.11152](https://arxiv.org/abs/1812.11152).
- [12] F. Bencs, E. Davies, V. Patel, and G. Regts. On zero-free regions for the anti-ferromagnetic Potts model on bounded-degree graphs (2018). arXiv: [1812.07532](https://arxiv.org/abs/1812.07532).

Journal publications

- [11] E. Davies, R. de Joannis de Verclos, R. J. Kang, and F. Pirot. Colouring triangle-free graphs with local list sizes. *Random Structures & Algorithms* (2020), to appear. arXiv: [1812.01534](https://arxiv.org/abs/1812.01534).
- [10] E. Davies. Counting proper colourings in 4-regular graphs via the Potts model. *Electronic Journal of Combinatorics* 25.4 (2018), P4.7. DOI: [10.37236/7743](https://doi.org/10.37236/7743). arXiv: [1801.07547](https://arxiv.org/abs/1801.07547).
- [9] E. Davies, M. Jenssen, W. Perkins, and B. Roberts. Tight bounds on the coefficients of partition functions via stability. *Journal of Combinatorial Theory Series A* 160 (2018), 1–30. DOI: [10.1016/j.jcta.2018.06.005](https://doi.org/10.1016/j.jcta.2018.06.005). arXiv: [1704.07784](https://arxiv.org/abs/1704.07784).
- [8] E. Davies, M. Jenssen, W. Perkins, and B. Roberts. Extremes of the internal energy of the Potts model on cubic graphs. *Random Structures & Algorithms* 53.1 (2018), 59–75. DOI: [10.1002/rsa.20767](https://doi.org/10.1002/rsa.20767). arXiv: [1610.08496](https://arxiv.org/abs/1610.08496).
- [7] E. Davies, M. Jenssen, W. Perkins, and B. Roberts. On the average size of independent sets in triangle-free graphs. *Proceedings of the American Mathematical Society* 146 (2018), 111–124. DOI: [10.1090/proc/13728](https://doi.org/10.1090/proc/13728). arXiv: [1606.01043](https://arxiv.org/abs/1606.01043).
- [6] E. Davies, M. Jenssen, and B. Roberts. Multicolour Ramsey numbers of paths and even cycles. *European Journal of Combinatorics* 63 (2017), 124–133. DOI: [10.1016/j.ejc.2017.03.002](https://doi.org/10.1016/j.ejc.2017.03.002). arXiv: [1606.00762](https://arxiv.org/abs/1606.00762).
- [5] E. Davies, M. Jenssen, W. Perkins, and B. Roberts. Independent Sets, Matchings, and Occupancy Fractions. *Journal of the London Mathematical Society* 96 (2017), 47–66. DOI: [10.1112/jlms.12056](https://doi.org/10.1112/jlms.12056). arXiv: [1508.04675](https://arxiv.org/abs/1508.04675).

Conference publications

- [4] E. Davies, M. Jenssen, W. Perkins, and B. Roberts. Tight bounds on the coefficients of partition functions via stability (extended abstract). *Electronic Notes in Discrete Mathematics* 61 (2017), 317–321. DOI: [10.1016/j.endm.2017.06.054](https://doi.org/10.1016/j.endm.2017.06.054).
- [3] E. Davies. Counting in hypergraphs via regularity inheritance (extended abstract). *Electronic Notes in Discrete Mathematics* 49 (2015), 413–417. DOI: [10.1016/j.endm.2015.06.058](https://doi.org/10.1016/j.endm.2015.06.058).

Talks

Conferences and workshops

2018	Aug	Algorithmic and Combinatorial Aspects of Partition Functions	Amsterdam, Netherlands
	Mar	Workshop on Graph Limits in Bohemian Switzerland	Janov, Czechia
2017	Aug	European Conference on Combinatorics, Graph Theory and Applications (EUROCOMB 2017)	Vienna, Austria
	May	Two one-day Colloquia in Combinatorics, LSE (invited)	London, UK
2016	Aug	Student Combinatorics Day (invited)	Birmingham, UK
2015	Aug	European Conference on Combinatorics, Graph Theory and Applications (EUROCOMB 2015)	Bergen, Norway
	Jul	Novi Sad Workshop on Foundations Of Computer Science	Novi Sad, Serbia

	Apr	Postgraduate Combinatorial Conference, QMUL	London, UK
2014	Jul	SUMMIT 190: Balogh, Csaba, Hajnal, and Pluhar are 190 (invited)	Szeged, Hungary

Seminars

2020	Feb	Discrete Mathematics Seminar, KdVI / CWI	Amsterdam, Netherlands
	Jan	CS Theory Seminar, CU Boulder	Boulder, Colorado
2019	Sep	CS Theory Seminar, CU Boulder	Boulder, Colorado
	Apr	Geometry of Polynomials Seminar, Simons Institute	Berkeley, California
2018	May	Applied Stochastics Seminar, Radboud University	Nijmegen, Netherlands
	Jan	Discrete Mathematics Seminar, KdVI / CWI	Amsterdam, Netherlands
2017	Oct	Discrete Mathematics Seminar, KdVI / CWI	Amsterdam, Netherlands
	Feb	Combinatorics Seminar	Oxford, UK
	Feb	Discrete Mathematics Seminar, KdVI / CWI	Amsterdam, Netherlands
	Jan	PhD Seminar on Combinatorics, Games and Optimisation, LSE	London, UK
2016	Apr	Seminário de Teoria da Computação, Combinatória e Otimização	São Paulo, Brazil
2015	Nov	Discrete Geometry and Combinatorics Seminar, UCL	London, UK
	Oct	Mathematics Lunchtime Seminar, LSE	London, UK
	Apr	Combinatorics Seminar, Freie Universität	Berlin, Germany
2013	Nov	Mathematics Lunchtime Seminar, LSE	London, UK

Research Visits

2019	Jan	Simons Institute for the Theory of Computing <i>Geometry of Polynomials</i>	Berkeley, California
2018	Feb	Instituto Nacional de Matemática Pura e Aplicada <i>Graphs and Randomness Workshop</i>	Rio de Janeiro, Brazil
2016	Apr	Universidade de São Paulo , Departamento de Ciência da Computação <i>with Yoshiharu Kohayakawa</i>	São Paulo, Brazil
	Mar	Instituto Nacional de Matemática Pura e Aplicada <i>with Rob Morris</i>	Rio de Janeiro, Brazil
2015	Sep	Group Workshop , Institute of Mathematics, Freie Universität Berlin <i>with Tibor Szabó</i>	Děčín, Czech Republic

Schools

2015	Jul	Regularity and Analytic Methods in Combinatorics University of Warwick	Coventry, UK
2014	Jun	Budapest Summer School in Discrete Mathematics Eötvös Loránd University	Budapest, Hungary

Teaching

2018	Representation Theory , teaching assistant, exam setting, exam marking	UvA
	Algebraic Methods in Combinatorics , seminar teaching assistant	UvA
2016	Mathematics Support Centre , one-to-one tuition in a variety of courses	LSE
2015	Mathematics Support Centre , one-to-one tuition in a variety of courses	LSE
	Real Analysis (MA203) , class teacher for 2 groups of 15 students	LSE
2014	Graph Theory (MA316) , class teacher for 1 group of 15 students	LSE

Further Mathematical Methods (MA212), class teacher for 3 groups of 15 students LSE
2013 **Mathematical Methods (MA100)**, class teacher for 3 groups of 15 students LSE

Academic Service

Peer review

Combinatorica, European Journal of Combinatorics, Inventiones Mathematicae, Journal of Graph Theory, Electronic Journal of Combinatorics

Other Experience

Athena Swan Assessment Team Member, London School of Economics and Political Science Jan 2016
Green Impact Team Member, London School of Economics and Political Science Sep 2015
Intern, NRICH Project, University of Cambridge Jun 2012
Volunteer Mathematics Tutor, STIMULUS, Fen Ditton Community Primary Oct 2011
Intern, Centre for Sports Engineering Research, Sheffield Hallam University Sep 2011