Annika Heckel

Curriculum Vitae

Mathematical Institute
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Employment

Since 02/2022	**Assistant Professor (tenure track)**, *Mathematical Institute*, Uppsala University, Sweden.
Spring 2025	**Research member**, *SLMath (MSRI)*, Berkeley, USA. 4 month research membership in the semester programme 'Extremal Combinatorics'
2019 – 2022	**Postdoctoral Research Assistant**, *Department of Mathematics*, Ludwig-Maximilians-Universität München, Germany. Working with Prof. Konstantinos Panagiotou on the ERC project 'Phase Transitions in Random Constraint Satisfaction Problems'.
2016 – 2019	**Postdoctoral Research Assistant**, *Mathematical Institute*, University of Oxford, UK. Working with Prof. David Conlon on the ERC project 'Randomness and pseudorandomness in discrete mathematics'.

Education

2011 – 2017	**DPhil in Mathematics**, *Balliol College, University of Oxford*. Supervisor: Prof. Oliver Riordan, Thesis: *Colourings of Random Graphs*
2005 – 2011	**Diplom (MSc equivalent) in Mathematics**, *LMU Munich*, Germany. Minor: Computer Science. *Passed with distinction, Grade 1.0*
2008 – 2009	**Visiting Student in Mathematics**, *Balliol College, University of Oxford*.

Parental leave

2023 – 2024	12 months parental leave, October 2023 – September 2024
2013 – 2014	12 months parental leave, October 2013 – September 2014

Research funding

2023-2027	Starting Grant from the Swedish Research Council, 'Concentration versus spread — tools, lower bounds and applications', reg. nr. 2022-02829. 4,000,000 SEK (roughly €350,000)
2020	Robert Bartnik Visiting Fellowship, Monash University, Melbourne, 15,494 AUD (roughly €9,400). Funding for a six week research stay to work with Nicholas Wormald. Planned for 2020, cancelled due to pandemic travel restrictions.
2016	London Mathematical Society Postdoctoral Mobility Grant, visiting fellowship at LMU Munich, £7,800 (roughly €9,200)(declined in favour of postdoc position)

Awards

2024	Frontiers of Science Award in Mathematics, *International Congress of Basic Science*
2004	Bronze medal, *International Mathematical Olympiad*

Scholarships

2016	Vice Chancellors' Fund Award, University of Oxford
2015 – 2016	Mathematical Prizes Fund, Mathematical Institute, University of Oxford
2011 – 2015	Scatcherd European Scholarship, University of Oxford
2011 – 2015	EPSRC Studentship
2005 – 2011	Maximilianeum Foundation Scholarship (6–8 students selected each year amongst all Bavarian school leavers)
2005 – 2011	German National Academic Foundation Undergraduate Scholarship
2005 – 2011	Max Weber Scholarship under the Bavarian Elite Support Act BayEFG
2008 – 2009	German National Academic Foundation Scholarship for study abroad

Service

Since 2025	Handling Editor, *Combinatorial Theory*

Invited conference talks

2025	Workshop 'Graph Theory: Extremal, Probabilistic and Structural', SLMath, Berkeley.
2024	Clay Mathematics Institute Workshop 'New Frontiers in Probabilistic and Extremal Combinatorics', Oxford.
2024	Frontiers of Science Award lecture, International Congress of Basic Science, Beijing.
2023	Random Structures & Algorithms 2023, plenary speaker. CMU, Pittsburgh.
2023	London Combinatorics Colloquia, LSE & QMUL, London.
2022	Oberwolfach Workshop "Combinatorics, Probability and Computing".
2022	Rényi-100, Budapest.
2021	8th European Congress of Mathematics, Minisymposium "Extremal & Probabilistic Combinatorics", online.
2021	CanaDAM, Minisymposium "Probabilistic approaches", online.
2020	Oberwolfach Workshop "Combinatorics".
2020	Simons Institute Workshop "Concentration of Measure Phenomena", online.
2020	DMV Minisymposium "Extremal and Probabilistic Combinatorics", online.
2019	Oberwolfach Workshop "Combinatorics, Probability and Computing".
2018	Clay Mathematics Institute workshop "Recent Advances in Extremal Combinatorics", Oxford.
2018	ICM 2018 Satellite Meeting "Combinatorics: extremal, probabilistic and additive", São Paulo.
2018	Young Mathematicians' Colloquium, plenary speaker, Birmingham.
2018	Workshop on Random Graphs and Processes, King's College London.
2016	Workshop 'Large-scale structures in random graphs', Alan Turing Institute, London.

Seminar Talks

2023	Probability and Combinatorics Seminar, Uppsala.
2022	Probability and Combinatorics Seminar, Uppsala.
2021	Oberseminar Mathematische Stochastik, Universität Münster, online.

2021	LSE Combinatorics Seminar, Round the World Relay in Combinatorics, online.
2021	Probability and Combinatorics Seminar, Uppsala.
2021	BYO Workshop in Probability and Finance, LMU Munich
2020	Research Seminar in Combinatorics, Tel Aviv University, online.
2020	Combinatorics and Optimization Seminar, TU Graz, online.
2020	Seminar of the Combinatorial Mathematics Society of Australasia, online.
2020	Webinar "Extremal and Probabilistic Combinatorics". Link to recording.
2019	Probability Seminar, Princeton University.
2019	Discrete Mathematics Seminar, Rutgers University.
2019	Combinatorial Theory Seminar, University of Oxford
2019	Combinatorics Seminar, University of Birmingham.
2018	DIMAP Seminar, University of Warwick.
2018	Probability seminar, University of Bath.
2018	Mathematical Sciences Seminar, Birkbeck, University of London.
2016	Combinatorial Theory Seminar, University of Oxford.
2016	Seminar on Combinatorics, Games and Optimisation, LSE.
2016	Mittagsseminar, ETH Zürich.
2016	Combinatorics Seminar, University of Cambridge.
2016	Combinatorics Seminar, University of Bristol.
2016	Combinatorics Seminar, University of Birmingham.
2012	Combinatorial Theory Seminar, University of Oxford.

Contributed talks at conferences and workshops

2023	Probabilistic Midwinter Meeting, Umeå.
2022	Random Structures and Algorithms, Poznan.
2019	Random Structures and Algorithms, ETH Zürich.
2017	Random Structures and Algorithms, Poznan.
2016	Austrian Stochastics Days, TU Graz.
2016	ALEA in Europe Meeting, Munich.
2013	Young Women in Discrete Mathematics, Bonn.
2012	Postgraduate Combinatorial Conference, Warwick.
2011	Memphis-Budapest Summer School in Combinatorics, Budapest.

Teaching Experience

Uppsala University

Autumn 25	Upcoming course: 1MA170 Graph theory (lecturer)
Autumn 24	PhD course Probabilistic Combinatorics (co-lecturer with Fiona Skerman)
	1MA170 Graph theory (lecturer)
Spring 23	1MS321 Probability and Statistics for Computer Science (lecturer)
Autumn 22	1MS005 Probability and Statistics (lecturer)
Spring 22	1MS321 Probability and Statistics for Computer Science (lecturer)

LMU Munich

20/21	Co-lecturer for *Introduction to Probability* (Einführung in die Stochastik)
06/07	Tutor for *Analysis I*

Wadham College, University of Oxford

2018	College tutor for *Integration*
2017	College tutor for *Analysis II* and *Integration*

Mathematical Institute, University of Oxford

2013	TA for *Graph Theory*
2012	Class tutor for *Martingales through Measure Theory* and TA for *Probabilistic Combinatorics*
2011	TA for *Martingales through Measure Theory*

List of publications

Preprints:

Sharp thresholds for factors in random graphs (with Fabian Burghart, Marc Kaufmann, Noela Müller, Matija Pasch), 2024. Preprint available at `https://arxiv.org/abs/2411.14138`.

The difference between the chromatic and the cochromatic number of a random graph, 2024. Preprint available at `https://arxiv.org/abs/2409.17614`.

Colouring random graphs: Tame colourings (with K. Panagiotou), 2023. Preprint available at `https://arxiv.org/abs/2306.07253`.

Journal papers:

[10] On a question of Erdős and Gimbel on the cochromatic number, *The Electronic Journal of Combinatorics* 31(4), P4.72, 2024.

[9] The hitting time of clique factors (with M. Kaufmann, N. Müller, M. Pasch), *Random Structures and Algorithms* 65(2), 275–312, 2024.

[8] How does the chromatic number of a random graph vary? (with O. Riordan), *Journal of the London Mathematical Society* 108(5), 1769–1815, 2023.

[7] Random triangles in random graphs. *Random Structures and Algorithms* 59(4), 616–621, 2021.

[6] Non-concentration of the chromatic number of a random graph. *Journal of the American Mathematical Society* 34, 245–260, 2021.

[5] Sharp concentration of the equitable chromatic number of dense random graphs. *Combinatorics, Probability and Computing* 29(2), 213–233, 2020.

[4] The chromatic number of dense random graphs. *Random Structures and Algorithms* 53(1), 140–182, 2018.

[3] On the threshold for rainbow connection number r in random graphs (with O. Riordan), *Graphs and Combinatorics* 32(1), 161–174, 2016.

[2] Mathematical foundations of and empirical investigations into the dynamic of top positions: Stabilization Effect, Reversed Matthew Effect, and Heraclitus Effect (with A. Ziegler and A. Ziegler), *Psychological Test and Assessment Modeling* 55(4), 401–414, 2013.

[1] The Hitting Time of Rainbow Connection Number Two (with O. Riordan), *The Electronic Journal of Combinatorics* 19, P37, 1–14, 2012.

Conference papers:

On the concentration and non-concentration of the chromatic number of a random graph. *To appear in 'Proceedings of the International Congress of Basic Science 2024'.*

The hitting time of clique factors (with M. Kaufmann, N. Müller and M. Pasch). *Proceedings of the 12th European Conference on Combinatorics, Graph Theory and Applications EUROCOMB'23*, 552–560, 2023.

Oberwolfach reports:

Cliques in the random graph process and the hitting time of clique factors (with M. Kaufmann, N. Müller, M. Pasch). Oberwolfach Workshop 2217 'Combinatorics, Probability and Computing", 14–16, 2022.

Non-concentration of the chromatic number (with O. Riordan). Oberwolfach Workshop 2002 "Combinatorics", 26–29, 2020.

Non-concentration of $\chi(G_{n,\frac{1}{2}})$. Oberwolfach Workshop 1916 "Combinatorics, Probability and Computing", 1141–1144, 2019.