

# Richard Montgomery

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## Employment

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04/15 – 08/15	Postdoctoral Fellow	University of Birmingham
10/15 – 09/19	Junior Research Fellow	Trinity College, Cambridge
04/18 – 07/20	Birmingham Fellow	University of Birmingham
08/20 – 07/21	Senior Birmingham Fellow	University of Birmingham
08/21 – 03/22	Reader in Combinatorics	University of Birmingham
04/22 –	Associate Professor	University of Warwick

## Education

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10/07 – 06/11	BA with MMath	University of Cambridge
10/11 – 06/15	PhD (Supervised by Prof. Andrew Thomason)	University of Cambridge

## Prizes and Grant Awards

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2020	Philip Leverhulme Prize	
2020	ERC Starting Grant	
2019	European Prize in Combinatorics	Jointly with Alexey Pokrovskiy.

## Papers and preprints

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1. Logarithmically-small minors and topological minors  
Journal of the London Mathematical Society, 2014.
2. Almost all friendly matrices have many obstructions  
SIAM Journal on Discrete Mathematics, 2015.
3. A proof of Mader’s conjecture on large clique subdivisions in  $C_4$ -free graphs  
With Hong Liu.  
Journal of the London Mathematical Society, 2017.
4. Fractional clique decompositions of partite graphs  
Combinatorics, Probability and Computing, 2017.
5. Fractional clique decompositions of dense graphs and hypergraphs  
With Ben Barber, Daniela Kühn, Allan Lo and Deryk Osthus.  
Journal of Combinatorial Theory, Series B, 2017.
6. On the decomposition threshold of a given graph  
With Stefan Glock, Daniela Kühn, Allan Lo and Deryk Osthus.  
Random Structures & Algorithms, to appear.

7. Spanning trees in random graphs  
Advances in Mathematics, 2019
8. Hamiltonicity in random graphs is born resilient  
Journal of Combinatorial Theory, Series B, 2018.
9. Rainbow spanning trees in properly coloured complete graphs  
With József Balogh and Hong Liu.  
Discrete Applied Mathematics, 2018.
10. Fractional clique decompositions of dense graphs  
Random Structures & Algorithms, 2018.
11. Forcing large tight components in 3-graphs  
With Agelos Georgakopoulos and John Haslegrave.  
European Journal of Combinatorics, 2019.
12. Embedding spanning bounded degree graphs in randomly perturbed graphs  
With Julia Böttcher, Olaf Parczyk and Yury Person.  
Random Structures & Algorithms, 2020.
13. Universality for bounded degree spanning trees in randomly perturbed graphs  
With Julia Böttcher, Jie Han, Yoshiharu Kohayakawa, Olaf Parczyk  
and Yury Person.  
Mathematika, 2019.
14. Embedding rainbow trees with applications to graph labelling and decomposition  
With Alexey Pokrovskiy and Benny Sudakov.  
Journal of the European Mathematical Society, 2020.
15. Decompositions into spanning rainbow structures  
With Alexey Pokrovskiy and Benny Sudakov.  
Proceedings of the London Mathematical Society, 2019.
16. Spanning surfaces in 3-graphs  
With Agelos Georgakopoulos, John Haslegrave and Bhargav Narayanan.  
Journal of the European Mathematical Society, 2020.
17. Minimalist designs  
With Ben Barber, Stefan Glock, Daniela Kühn, Allan Lo and Deryk Osthus.  
Random Structures & Algorithms, 2020.
18. Hamiltonicity in random directed graphs is born resilient  
Combinatorics, Probability and Computing, 2020.
19. Decompositions into isomorphic rainbow spanning trees  
With Stefan Glock, Daniela Kühn and Deryk Osthus.  
Journal of Combinatorial Theory, Series B, 2020.
20. A proof of Ringel's Conjecture  
With Alexey Pokrovskiy and Benny Sudakov.
21.  $C_4$ -free subgraphs with large average degree  
With Alexey Pokrovskiy and Benny Sudakov.  
Israel Journal of Mathematics, 2021.

22. A solution to Erdős and Hajnal's odd cycle problem  
with Hong Liu.  
Journal of the American Mathematical Society, to appear.
23. Spanning trees in dense directed graphs  
with Amarja Kathapurkar.  
Journal of Combinatorial Theory, Series B, 2022.
24. Spanning cycles in random directed graphs
25. Trees with few leaves in tournaments  
with Alistair Benford.  
Journal of Combinatorial Theory, Series B, 2022.
26. Transversal factors and spanning trees  
with Alp Müyesser and Yani Pehova.  
Advances in Combinatorics, 2022.
27. Trees with many leaves in tournaments  
with Alistair Benford.
28. Towards the Erdős-Gallai Cycle Decomposition Conjecture  
with Matija Bucić.

## Seminars and Talks

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- 05/13 Combinatorics seminar, University of Cambridge.
- 08/13 Talk at the 16th Random Structures and Algorithms Conference.
- 03/14 Seminar on Discrete and Applicable Mathematics, LSE.
- 04/14 Mittagsseminar, ETH, Zurich.
- 10/14 Combinatorics seminar, University of Oxford.
- 10/14 Combinatorics seminar, University of Birmingham.
- 12/14 Combinatorics seminar, Queen Mary University of London.
- 03/15 Talk at the 4th Joint BMC/BAMC Colloquium.
- 10/16 Combinatorics seminar, University of Birmingham.
- 11/16 Combinatorics seminar, University of Warwick.
- 03/16 Mittagsseminar, ETH, Zurich.
- 11/17 Combinatorics seminar, University of Cambridge.
- 12/17 Oberseminar Diskrete Mathematik, Goethe University.
- 11/18 Dimap seminar, University of Warwick.
- 04/19 Mittagsseminar, ETH, Zurich.
- 11/19 Seminar, Queen Mary, University of London.
- 10/20 Extremal and Probabilistic Combinatorics Webinar.
- 10/20 Combinatorics Seminar at the University of Victoria, Canada (Online).
- 11/20 TU Graz Combinatorics and Optimization Seminar (Online).
- 01/21 Oxford Discrete Mathematics and Probability Seminar (Online).
- 05/22 Combinatorics seminar, University of Warwick.
- 10/22 Combinatorics seminar, University of Bristol.
- 11/22 Combinatorial Theory seminar, University of Oxford.

## Workshops attended

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- 01/16 Workshop on Graph Theory, Oberwolfach.
- 12/16 Workshop on Large Scale Structures in Random Graphs, London.
- 01/17 Workshop on Combinatorics, Oberwolfach.
- 07/18 Large networks and random graphs, Frankfurt.
- 08/18 Southwestern German Workshop on Graph Theory.
- 12/18 Workshop on Recent Advances in Extremal Combinatorics, Clay Institute, Oxford.
- 04/19 Workshop on Combinatorics, Probability and Computing, Oberwolfach.
- 09/19 Workshop on Probabilistic and Extremal Combinatorics, Banff.
- 01/20 Workshop on Combinatorics, MFO, Oberwolfach.
- 04/22 Workshop on Combinatorics, Probability and Computing, Oberwolfach.
- 05/22 Cross-community collaborations in Combinatorics, Banff.
- 08/22 Armenian Workshop on Graphs, Combinatorics, Probability, and their application to machine learning, Armenia.
- 08/22 Recent Advances in Probabilistic and Extremal Combinatorics, Ascona.
- 01/23 Workshop on Combinatorics, MFO, Oberwolfach.

## Teaching and interviewing

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- 2011-2018 Regular supervision of undergraduates in Cambridge, supervising Graph Theory, Numbers and Sets, and Coding and Cryptography.
- 2012-2015 Interviewed prospective undergraduate students for Peterhouse, Cambridge.
- 2016-2017 Interviewed prospective undergraduate students for Trinity College, Cambridge.
- 2018 Graduate course on Topics in Random Graphs at the University of Cambridge.
- 2019 Co-supervision of Master's project on graph colouring at the University of Birmingham (UoB).
- 2019-2020 First year tutorials at the University of Birmingham.
- 2019-2021 Yearly supervision of a Master's project at the University of Birmingham.
- 2020-2021 First and second year tutorials at the University of Birmingham.
- 2021-2022 Half of lecture course 'Advanced Topics in Combinatorics' given at the University of Birmingham.
- 2022-2023 Lecture course on 'Theory of Random Graphs' at the University of Warwick.