

Natalie Behague

nbehague@uvic.ca

<https://nb453.user.srcf.net>

Education

- PhD**, Queen Mary University of London (UK) Sep 2016 – Aug 2020
Supervisor: Dr. Robert Johnson
Title: Topics in Extremal and Probabilistic Combinatorics
- BA with MMath**, Trinity College, University of Cambridge (UK) Oct 2012 – Jun 2016
Part IA: 2.1, Part IB: 1, Part II: 2.1, Part III: Distinction
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Employment

- University of Victoria**, Canada Jan 2022 – Dec 2023
PIMS Postdoctoral Fellow, working with Dr. Natasha Morrison and Dr. Jonathan Noel
- Toronto Metropolitan University (formerly Ryerson)**, Canada Oct 2020 – Oct 2021
Postdoctoral Research Fellow, Graphs at Ryerson Research Group
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Publications

Published and Accepted

- [1] **2022** (with Robert Johnson). “Synchronizing times for k -sets in automata”. In: *Electron. J. Combin.* 29.3, P3.41.
- [2] **2022** (with Trent G Marbach and Paweł Prałat). “Tight Bounds on Probabilistic Zero Forcing on Hypercubes and Grids”. In: *Electron. J. Combin.* 29.1, P1.3.
- [3] **2022** (with Anthony Bonato, Melissa A. Huggan, Trent G. Marbach, and Brittany Pittman). “The localization capture time of a graph”. In: *Theoretical Computer Science* 911, pp. 80–91.
- [4] **2022 (accepted)** (with Anthony Bonato, Melissa A. Huggan, Rehan Malik, and Trent Marbach). “The Iterated Local Transitivity Model for hypergraphs”. In: *Discrete Applied Mathematics*.
- [5] **2019**. “Semi-perfect 1-factorizations of the hypercube”. In: *Discrete Mathematics* 342.6, pp. 1696–1702.
- [6] **2018**. “Hypergraph saturation irregularities”. In: *Electron. J. Combin.* 25.2, P2.11.

Submitted and In Preparation

- [7] **2022+** (with Tom Johnston, Shoham Letzter, Natasha Morrison, and Shannon Ogden). “The rainbow saturation number is linear”. URL: [arXiv:2211.08589](https://arxiv.org/abs/2211.08589).
 - [8] **2022+** (with Natasha Morrison and Jonathan Noel). “Common pairs of graphs”. URL: [arXiv:2208.02045](https://arxiv.org/abs/2208.02045).
 - [9] **2022+** (with Paweł Prałat, Trent G. Marbach, and Andrzej Ruciński). “Subgraph games in the semi-random graph process and its generalization to hypergraphs”. URL: [arXiv:2105.07034](https://arxiv.org/abs/2105.07034).
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Awards and Funding

- PIMS Postdoctoral Fellowship**, University of Victoria 2022 – 2023
- EPSRC Doctoral Studentship**, Queen Mary University of London 2016 – 2020
- Clay Mathematics Institute Funding** US\$1,120 (~£940) to support conference travel Jul 2022
- QMUL Postgraduate Research Fund** £400 to support conference travel Jun 2019
- London Mathematical Society Funding** £100 to support conference travel Jun 2019
- Undergraduate Summer Research Scholarship**, Trinity College, Cambridge (£2000) Jul – Sep 2015
Supervisor: Dr. Stuart Martin
Title: The Representation Theory of the Symmetric Group
- Senior Scholar**, Trinity College, University of Cambridge Jul 2014
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Talks

Invited Conference Talks

- CanadAM Jun 2023
- Moscow Conference on Combinatorics and Applications, MIPT Jul 2021
- Open University Winter Combinatorics Meeting Feb 2019

Invited External Seminar Talks

One World Combinatorics on Words Seminar	Oct 2022
Combinatorics Seminar, University of Bristol	Feb 2019, Apr 2021, Nov 2021
Graphs and Matroids Seminar via Matroid Union blog	Oct 2021
Combinatorics Study Group, QMUL	Oct 2021
Discrete Mathematics Seminar, TU Ilmenau	Jul 2021
Women in Combinatorics Virtual Colloquium	Feb 2021
Mathematical Sciences Seminar, Birkbeck University of London	Oct 2019
PhD Seminar on Combinatorics, Games and Optimisation, LSE	Oct 2019
Combinatorics Seminar, University of Warwick	Oct 2018
Combinatorics Seminar, University of Cambridge	Feb 2018

Select Other Talks

Random Structures and Algorithms, Institute of European Culture Gniezno	Aug 2022
Young Researchers in Combinatorics workshop, ICMS	Jul 2022
Cross-community Collaborations in Combinatorics workshop, BIRS	Jun 2022
CanadAM	May 2021
Workshop on Graph Theory & Combinatorics in Thuringia	Jul 2020
British Combinatorial Conferences	Jul 2019, Jul 2021, Jul 2022

Select Workshops and Conferences

Random Structures and Algorithms, Institute of European Culture Gniezno	Aug 2022
Young Researchers in Combinatorics workshop, ICMS	Jul 2022
Cross-community Collaborations in Combinatorics workshop, BIRS	May 2022
Graduate Research Workshop in Combinatorics	Jun 2021
CanadAM	May 2021
Workshop on Graph Theory & Combinatorics in Thuringia	Jul 2020
British Combinatorial Conferences	Jul 2017, Jul 2019, Jul 2021, Jul 2022

Teaching

Matrix Algebra I (lecturing , writing homework assignments and exams)	Autumn 2022
Random Processes (running tutorials), Calculus I (running tutorials, marking)	Autumn 2019
Coding Theory (tutorial assistant, marking)	Spring 2019
Geometry I (running tutorials), Coding Theory (tutorial assistant, marking)	Spring 2018
Differential and Integral Analysis (tutorial assistant, marking)	Spring 2017

Outreach and Engagement

Imagining UVic , <i>The Catalan Numbers</i>	Oct 2022
Wrote and delivered 2 hour workshop for small group of schoolgirls aged 16–18.	
QMUL Girls in Maths Taster Days , <i>Graph Theory</i>	Mar 2019, 2020
Wrote and delivered 45 minute lecture to 140 schoolgirls aged 16–17.	
Royal Institution Mathematics Masterclasses , <i>Geometry in the 4th Dimension</i>	Feb 2019
Delivered a 2.5 hour masterclass for ninety schoolchildren aged 16–17.	
International Mathematical Olympiad , Coordinator	Jul 2019
Co-created a mark scheme, marked scripts and coordinated marks with team leaders.	
QMUL Year 11 Maths Summer Schools , <i>Codes and Ciphers</i>	2017, 2018, 2019
Wrote and helped to deliver three day extended research project.	
UKMT Summer Schools (Various) , <i>Modular Arithmetic/Graphs/Catalan Numbers</i>	2013 – 2018
Wrote and delivered 1.5 hour workshops for groups of twenty to thirty schoolchildren aged 13–16.	

Administrative Experience and Academic Service

Referee Electronic Journal of Combinatorics; Journals of Combinatorial Theory A and B; Discrete Mathematics; Mathematika.	
Queen Mary Internal Postgraduate Seminar (QuIPS) Organiser	2017–2018
Organised weekly seminar for mathematics postgraduates.	
Emmy Noether Society Treasurer	2014
Treasurer of student society to promote women in maths; won LMS Small Grant for Education for the society.	

Technical Skills

Programming Languages Python (good), C, GAP, MATLAB (all previously good but rusty).	
Professional Experience Employed as a software developer at Metaswitch Networks for two months in each of 2013 and 2014. Was awarded a bonus and a scholarship to return for a second summer.	