

# Nicholas R. Beaton

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CONTACT	School of Mathematics and Statistics Office 205, Peter Hall Building The University of Melbourne VIC 3010 Australia	Office: +61-3-83449479 nrbeaton@unimelb.edu.au www.nicholasbeaton.com
EMPLOYMENT	<p><b>The University of Melbourne</b>, Parkville, Victoria, Australia School of Mathematics and Statistics</p> <p><i>Lecturer in Mathematical Physics</i> <i>Research Fellow</i> <i>ARC DECRA Research Fellow</i></p> <p><b>The University of Saskatchewan</b>, Saskatoon, Saskatchewan, Canada Department of Mathematics and Statistics</p> <p><i>PIMS Postdoctoral Fellow</i></p> <p><b>The University of Melbourne</b>, Parkville, VIC, Australia ARC Centre of Excellence for Mathematics and Statistics of Complex Systems (MASCOS) Department of Mathematics and Statistics</p> <p><i>Research Assistant and Casual Lecturer</i></p> <p><b>Laboratoire d'Informatique de Paris Nord (LIPN)</b> Université Paris-Nord (Paris 13) Villetaneuse, France</p> <p><i>Postdoctoral Researcher (ANR Project MAGNUM)</i></p>	<p><b>January 2022 – present</b> <b>May 2021 – January 2022</b> <b>January 2017 – April 2021</b></p> <p><b>December 2014 – December 2016</b></p> <p><b>January – December 2014</b></p> <p><b>November 2012 – October 2013</b></p>
EDUCATION	<p><b>The University of Melbourne</b>, Parkville, VIC, Australia</p> <p><i>Doctor of Philosophy</i></p> <ul style="list-style-type: none"><li>• Thesis topic: Combinatorics of Lattice Paths and Polygons</li><li>• Advisor: Prof. Anthony J. Guttmann</li></ul> <p><b>The University of Queensland</b>, St. Lucia, QLD, Australia</p> <p><i>BSc (Hons) – Mathematics</i></p> <ul style="list-style-type: none"><li>• University Medal and Graduate of the Year (2008)</li></ul>	<p><b>2009 – 2012</b></p> <p><b>2005 - 2008</b></p>
TEACHING	<p><b>The University of Melbourne</b></p> <p><i>MAST30012 Discrete Mathematics</i> <i>MAST90067 Advanced Methods: Transforms</i> <i>MAST90031 Enumerative Combinatorics</i> <i>MAST10007 Linear Algebra</i> <i>MAST30028 Numerical and Symbolic Mathematics</i> <i>MAST10005 Calculus I</i></p>	<p><b>Semester 2, 2022</b> <b>Semester 1, 2022</b> <b>Semester 1, 2021</b> <b>Semester 1, 2018</b> <b>Semester 2, 2014</b> <b>Semester 1, 2014</b></p>

## The University of Saskatchewan

MATH 327 Graph Theory

Term 2, 2015-2016

STAT 241 Probability Theory

Term 1, 2015-2016

MATH 328 Combinatorics and Enumeration

Term 2, 2014-2015

STAT 241 Probability Theory

Term 2, 2014-2015

### STUDENT SUPERVISION

#### Present

Zhong Zheng (SCIE30001, Semester 1 2023)

James Gleeson (MSc, co-supervising with Prof. Aleks Owczarek)

Tim Banova (PhD, co-supervising with Prof. Mark Holmes)

#### Completed

Xin Huang (MPhil, co-supervised with Prof. Mark Holmes, completed in 2023)

William Briggs (MSc, co-supervising with Prof. Aleks Owczarek, completed in 2022)

Ruijie Xu (PhD, co-supervised with Prof. Aleks Owczarek and Dr. Richard Brak, completed in 2021)

Leo Li & Jonathon Liu (AMSI summer vacation 2018/2019)

William Mead (SCIE30001, Summer Semester 2017/2018)

### RESEARCH INTERESTS

My research interests are in statistical mechanics, particularly lattice models of walks, polygons, animals and trees, and their applications to modelling interacting polymer systems. Problems in these fields are also frequently connected with complex analysis, stochastic processes and algorithms for counting and simulating discrete structures.

### GRANTS & AWARDS

Chief Investigator on Discovery Project (DP) from the Australian Research Council (ARC) **2023-2026**

Title: *Transformative simulation techniques for complex polymer networks*

Budget: \$412,000

Discovery Early Career Researcher Award (DECRA) from the ARC **2017-2020**

Title: *Statistical mechanics and topology of polymer systems*

Budget: \$337,869

Gavin Brown Prize from the Australian Mathematical Society **2018**

for best paper published in 2008-2016 (see [P7] in the attached Publication List)

### PUBLICATIONS

See the attached Publication List.

### CONFERENCE ORGANISATION

Chair of the A.J. Guttmann Prize committee at the 2023 ANZAMP Conference

February 7-9, 2023

Hobart, Australia

Co-organiser (Proceedings Editor) of the 31<sup>st</sup> International Conference on Formal Power Series and Algebraic Combinatorics (FPSAC 2019)

July 1-5, 2019

University of Ljubljana, Ljubljana, Slovenia

Co-organiser (Proceedings Editor) of the 29<sup>th</sup> International Conference on Formal Power Series and Algebraic Combinatorics (FPSAC 2017)

July 9-13, 2017

Queen Mary University of London, London, UK

Co-organiser of three Contributed Minisymposia on *Combinatorics, topology and statistical mechanics of polymer models*

11th Biennial Canadian Discrete and Algorithmic Mathematics Conference (CanaDAM)

June 1-4, 2015

University of Saskatchewan, Saskatoon, Canada

Member of the Selection Panel for the 2022 Early Career Researcher (ECR) Grant applications at the University of Melbourne.

Member of the *Research and Innovation Committee* and former member of the *Research and Industry Committee* in the School of Mathematics and Statistics at the University of Melbourne.

Member of the Advisory Board for *Journal of Physics A: Mathematical and Theoretical*.

Reviewer for ARC Discovery Project proposals.

Academic Advisor for several groups of BSc students at the University of Melbourne.

Mentor for several students at Elizabeth Blackburn Sciences (University High School) doing Extended Investigation research projects in 2019 and 2020.

Presented multiple talks for high school students at Enrichment Seminar Series organised by the School of Mathematics and Statistics.

Volunteer for *MathsCraft* events, which connect mathematicians with high school students and teachers at events focused on open-ended mathematical problems and thinking like a researcher.

Co-organiser of the Australian *National Science Quiz* 2017.

Multiple-time performer at *The Laborastory*, a monthly science-based storytelling event held in Melbourne.