Nicholas R. Beaton

CONTACT

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EMPLOYMENT

The University of Saskatchewan, Saskatoon, Saskatchewan, Canada

Department of Mathematics and Statistics

PIMS Postdoctoral Fellow **December 2014 – present**

The University of Melbourne, Parkville, VIC, Australia

ARC Centre of Excellence for Mathematics and Statistics of Complex Systems (MASCOS)
Department of Mathematics and Statistics

Research Assistant **January – December 2014**

Laboratoire d'Informatique de Paris Nord (LIPN)

Institut Galilée
Université Paris-Nord
Villetaneuse, France

Postdoctoral Researcher (ANR Project MAGNUM) **November 2012 – October 2013**

EDUCATION

The University of Melbourne, Parkville, VIC, Australia

Doctor of Philosophy **2009 – 2012**

- Thesis topic: Combinatorics of Lattice Paths and Polygons
- Advisor: Prof. Anthony J. Guttmann

The University of Queensland, St. Lucia, QLD, Australia

BSc (Hons) – Mathematics **2005 - 2008**

TEACHING

The University of Saskatchewan, Saskatoon, Saskatchewan, Canada

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**

The University of Melbourne, Parkville, VIC, Australia

MAST30028 Numerical and Symbolic Mathematics **Semester 2, 2014**
MAST10005 Calculus I **Semester 1, 2014**

RESEARCH INTERESTS

My research interests are in combinatorics and statistical mechanics. Problems in these fields are also frequently connected with complex analysis, stochastic processes and algorithms for counting and simulating discrete structures.

Journal Publications

[P10] N. R. Beaton, A. J. Guttmann, I. Jensen and G. F. Lawler
Compressed self-avoiding walks, bridges and polygons
Journal of Physics A: Mathematical and Theoretical **48** (2015), 454001.

[P9] N. R. Beaton and G. K. Iliev
Two-sided prudent walks: A solvable non-directed model of polymer adsorption
Journal of Statistical Mechanics: Theory and Experiment (2015), P09014.

[P8] N. R. Beaton
The critical pulling force for self-avoiding walks
Journal of Physics A: Mathematical and Theoretical **48** (2015), 16FT03.

[P7] N. R. Beaton, M. Bousquet-Mélou, J. de Gier, H. Duminil-Copin and A. J. Guttmann
The critical fugacity for surface adsorption of self-avoiding walks on the honeycomb lattice is $1+\sqrt{2}$
Communications in Mathematical Physics **326** (2014), 727–754.

[P6] N. R. Beaton
The critical surface fugacity of self-avoiding walks on a rotated honeycomb lattice
Journal of Physics A: Mathematical and Theoretical **47** (2014), 075003.

[P5] N. R. Beaton, A. J. Guttmann and I. Jensen
Two-dimensional self-avoiding walks and polymer adsorption: Critical fugacity estimates
Journal of Physics A: Mathematical and Theoretical **45** (2012), 055208.

[P4] N. R. Beaton, A. J. Guttmann and I. Jensen
A numerical adaptation of SAW identities from the honeycomb to other 2D lattices
Journal of Physics A: Mathematical and Theoretical **45** (2012), 035201.

[P3] N. R. Beaton, P. Flajolet, T. Garoni and A. J. Guttmann
Some new self-avoiding walk and polygon models
Fundamenta Informaticae **117** (2012), 19–33.

[P2] N. R. Beaton, P. Flajolet and A. J. Guttmann
The enumeration of prudent polygons by area and its unusual asymptotics
Journal of Combinatorial Theory, Series A **118** (2011), 2261–2290.

[P1] N. R. Beaton, P. Flajolet and A. J. Guttmann
The unusual asymptotics of 3-sided prudent polygons
Journal of Physics A: Mathematical and Theoretical **43** (2010), 342001.

Conference Papers

[C4] N. R. Beaton, J. Eng and C. E. Soteros
Asymptotics of polygons in restricted geometries subject to a force
To be presented at the 28th International Conference on Formal Power Series and Algebraic Combinatorics (FPSAC 2016 - Vancouver, Canada).

[C3] A. Bacher and N. R. Beaton
Weakly prudent self-avoiding bridges
Proceedings of the 26th International Conference on Formal Power Series and Algebraic Combinatorics (FPSAC 2014 - Chicago, USA), 827-838.

[C2] N. R. Beaton
The critical surface fugacity of self-avoiding walks on a rotated honeycomb lattice
Proceedings of the 25th International Conference on Formal Power Series and Algebraic Combinatorics (FPSAC 2013 - Paris, France), 665-676.

[C1] N. R. Beaton, F. Disanto, A. J. Guttmann and S. Rinaldi
On the enumeration of column-convex permutominoes
Proceedings of the 23rd International Conference on Formal Power Series and Algebraic Combinatorics (FPSAC 2011 - Reykjavik, Iceland), 111-122.

Conference Organisation

Co-organiser (with Andrew Rechnitzer of the University of British Columbia)
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

Selected Invited Presentations

Solvable models of polymer adsorption and first-order phase transitions
Guttmann 2015: 70 and Counting
December 7–8, 2015
Newcastle, Australia

Compressed random and self-avoiding walks
11th Prairie Discrete Mathematics Workshop
August 7–9, 2015
Banff International Research Station
Banff, Canada

Solvable self-avoiding walk and polygon models with large growth rates
May 12, 2015
Simon Fraser University
Vancouver, Canada

Models of pulled and compressed polymers
Workshop on Combinatorial Applications to Biology, Chemistry and Physics
June 21–22, 2014
University of Saskatchewan
Saskatoon, Canada

Solvable models of self-avoiding walks
September 30, 2013
Université de Genève
Geneva, Switzerland

Polymer adsorption on the honeycomb lattice
36th Conference on Stochastic Processes and their Applications
July 29 – August 2, 2013
University of Colorado
Boulder, Colorado, USA

Non-directed solvable models of polymer adsorption
May 16, 2013
LIAFA, Université Paris Diderot
Paris, France

Outreach

Multiple-time performer at *The Laborastory*, a monthly science-based storytelling event held in Melbourne, Australia. See my website for recordings of my performances.