

# Tyler Helmuth

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## Education

- Dec. 2014 PH.D. in Mathematics, University of British Columbia.  
*Advisor:* Prof. David Brydges.
- 2010 M.Sc. in Mathematics, University of British Columbia.  
*Advisor:* Prof. David Brydges.
- 2008 B.Sc. HON. in Mathematical Physics, University of Saskatchewan.

## Employment

- 2015 – 2017 POSTDOCTORAL FELLOW/VISITING ASSISTANT PROFESSOR in Mathematics at the University of California, Berkeley.
- May–Aug. 2015 VISITING SCHOLAR at the Institute for Applied Mathematics, Universität Bonn.
- Feb.–May 2015 POSTDOCTORAL FELLOW at the Institute for Computational and Experimental Research Mathematics, Brown University.

## Publications

### *In Preparation*

- 2016+ HAMMOND, A., AND HELMUTH, T. Directed Spatial Permutations on Asymmetric Tori.  
BRYDGES, D., HELMUTH, T., AND HOLMES, M. The Continuous-time Lace Expansion.

### *Preprints*

- 2016 HAMMOND, A. AND HELMUTH, T. Self-attractive Self-avoiding Walk. 34 pp. [[Preprint](#)]

### *Published*

- 2016 HELMUTH, T. Dimensional Reduction for Generalized Continuum Polymers. *J. Stat. Phys.* **165**(24), 24-43. [[arXiv](#)]  
HELMUTH, T. Loop-weighted Walk. *Ann. Inst. Henri Poincaré Comb. Phys. Interact.* **3**, 55-119. [[arXiv](#)]
- 2014 HELMUTH, T. Ising Model Observables and Non-Backtracking Walks. *J. Math. Phys.* **55**(8), 1–28. [[arXiv](#)]
- 2009 HELMUTH, T. AND PATRICK, G.W. Two rolling disks or spheres. *Discrete Contin. Dyn. Syst. Ser. S* **3**(1), 129–140.
- 2007 HELMUTH, T., SPITERI, R., AND SZMIGIELSKI, J. One-dimensional magnetotelluric inversion with radiation boundary conditions. *Can. Appl. Math. Q.* **15**(4), 419–444.

## Honours, Awards, & Fellowships

- 2015 – 2017 National Science and Engineering Research Council Postdoctoral fellowship.
- 2012 – 2014 University of British Columbia Graduate Fellowship.
- 2010 – 2012 National Science and Engineering Research Council CGS-D Scholarship.
- 2008 – 2010 National Science and Engineering Research Council CGS-M Scholarship.

## Scientific Talks

- 2016 Mathematical Physics and Probability Seminar, University of California Davis, November 30.  
Mathematics Colloquium, University of Oregon, October 10.  
Bay Area Discrete Math Day #33, University of California Davis, October 1.  
Algebra/Geometry/Combinatorics Seminar, San Francisco State University, September 14.  
Mathematical Physics and Probability Seminar, University of California Davis, June 2.  
Trends in Mathematical Crystallization Workshop, University of Warwick, May 4.
- 2015 Applied Math and Mathematical Physics Seminar, University of Saskatchewan, December 21.  
Oberseminar Stochastics, Universität Bonn, July 16.  
Expansion Methods in Statistical Mechanics Workshop, University of Utrecht, July 3.  
SFB 1060 Collaborative Research Center Seminar, Universität Bonn, June 16.  
Center of Mathematical Sciences & Applications Seminar, Harvard University, April 23.
- 2014 Mathematical Physics and Probability Seminar, University of California Davis, November 17.  
Probability Seminar, University of Kansas, November 12.  
Probability Seminar, University of California Berkeley, October 29.  
PIMS/MPrime Summer School in Probability, University of British Columbia, June 20.  
Gradient random fields workshop, Warwick EPSRC Symposium on Statistical Mechanics, May 27.
- 2012 Feza Gürsey Summer School in Mathematical Physics, Feza Gürsey Institute, June 25.  
PIMS/MPrime Summer School in Probability, University of British Columbia, June 14.  
Discrete Math Seminar, University of British Columbia, March 27.
- 2011 Applied Math and Mathematical Physics Seminar, University of Saskatchewan, December 20.

## Conferences, Workshops, & Programs

- 2017 Oberwolfach Mini-workshop “Cluster Expansions: From Combinatorics to Analysis through Probability”, February 5 – February 11.
- 2016 Bay Area Discrete Math Day #33, October 1.  
Banff International Research Station / Casa Matemática Oaxaca workshop “Random Structures in High Dimensions”, June 26 – July 1.  
University of Warwick workshop “Trends in Mathematical Crystallization”, May 3 – May 6.  
Simons Institute for the Theory of Computing program “Counting Complexity and Phase Transitions”, January 11 – May 13.
- 2015 Joint UC Davis / University of Warwick probability workshop, December 14–16.

Institute for Computational and Experimental Research Mathematics workshop “Crystals, Quasicrystals and Random Networks”, February 9–13.

Institute for Computational and Experimental Research Mathematics workshop “Small Clusters, Polymer Vesicles and Unusual Minima”, March 16–20.

Institute for Computational and Experimental Research Mathematics workshop “Limit Shapes”, April 13–17.

2014 Pacific Institute for the Mathematical Sciences/MPrime Summer School in Probability, June 2–27.

Warwick EPSRC Symposium on Statistical Mechanics: Gradient random fields, May 26–30.

2013 Prague School on Mathematical Statistical Mechanics, August 19–30.

2012 Feza Gürsey Summer School, June 20 – July 7.

Pacific Institute for the Mathematical Sciences/MPrime Summer School in Probability, June 4–15.

2010 Clay Mathematics Institute Summer School on Probability and Statistical Physics in Two and More Dimensions, July 11 – August 7.

2009 Pacific Institute for the Mathematical Sciences Summer School in Probability, June 8 – July 3.

## Teaching Experience

### *University of California, Berkeley*

Spring 2017 Introduction to Combinatorics.

Fall 2016 Ordinary differential equations.

Spring 2016 Ordinary differential equations.

### *University of British Columbia*

Fall 2012 Differential Calculus with Applications to Life Sciences.

Summer 2011 Integral Calculus with Applications to Commerce and Social Sciences.

## Activities

2016–2017 Committee member for Bay Area Discrete Math days.

Spring 2016 Co-organizer, along with Alan Hammond and Nike Sun, of the UC Berkeley probability seminar.

2009 – 2012 Committee member of the Mathematics Graduate Committee at the University of British Columbia.

2011 – 2012 Executive member of the teaching assistant union at the University of British Columbia.

2011 Completed the Instructional Skills Workshop, an internationally recognized 3.5 day workshop to enhance teaching effectiveness.

2011 Committee member for the Pacific Institute for Mathematics Sciences Young Researcher’s Conference, a three day conference for roughly 100 graduate students.

## Personal Information

Canadian citizen.