

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

- 2017 – 2020 RESEARCH ASSOCIATE in Mathematics at the University of Bristol.
- 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

- 2018+ BRYDGES, D., HELMUTH, T., AND HOLMES, M. The continuous-time lace expansion. 60 pp.

Preprints

- 2018 BAUERSCHMIDT, R., HELMUTH, T., AND SWAN, A. Dynkin isomorphism and Mermin–Wagner theorems for hyperbolic sigma models and recurrence of the two-dimensional vertex-reinforced jump process. 16 pp. *Submitted to Ann. Probab.* [[arXiv](#)]
- 2017 HAMMOND, A. AND HELMUTH, T. Self-attractive self-avoiding walk. 34 pp. *Submitted to Probab. Theory Relat. Fields* [[arXiv](#)]

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.

Grants, Awards, & Fellowships

- 2018 HIMR focused research grant for the workshop ‘Critical Phenomena in Random Environments’
- 2017 NSF US Junior Oberwolfach fellowship
- 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.

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.

Scientific Talks

- 2018 Horwitz Seminar, Tel Aviv University, Jun. 18.
 Stochastics Seminar, TU Budapest, May. 31.
 Probability Seminar, University of Bath, May 24.
 Statistical Sciences Seminar, University College London, May 10.
 Probability Seminar, KTH Royal Institute of Technology, Apr. 23.
 Göteborg Workshop, "Probabilistic approaches to quantum spin systems", Apr. 16.
 Stochastics Seminar, TU Budapest, Mar. 29.
 Probability Seminar, University of Cambridge, Mar. 6.
 Statistical Mechanics Seminar, University of Warwick, Feb. 22.
- 2017 Probability Seminar, University of Bristol, Oct. 20.
 Probability Seminar, Universidad Nacional Autónoma de México, Aug. 9.
 Mathematical Physics and Probability Seminar, University of California Davis, May 10.
 Probability Seminar, University of California Berkeley, May 3.
 Stochastics Seminar, University of Utah, Apr. 7.

- Oberwolfach Mini-workshop “Cluster Expansions: from Combinatorics to Analysis, through Probability”, Feb. 8.
- 2016 Mathematical Physics and Probability Seminar, University of California Davis, Nov. 30.
 Mathematics Colloquium, University of Oregon, Oct. 10.
 Bay Area Discrete Math Day #33, University of California Davis, Oct. 1.
 Algebra/Geometry/Combinatorics Seminar, San Francisco State University, Sep. 14.
 Mathematical Physics and Probability Seminar, University of California Davis, Jun. 2.
 Trends in Mathematical Crystallization Workshop, University of Warwick, May 4.
- 2015 Applied Math and Mathematical Physics Seminar, University of Saskatchewan, Dec. 21.
 Oberseminar Stochastics, Universität Bonn, Jul. 16.
 Expansion Methods in Statistical Mechanics Workshop, University of Utrecht, Jul. 3.
 SFB 1060 Collaborative Research Center Seminar, Universität Bonn, Jun. 16.
 Center of Mathematical Sciences & Applications Seminar, Harvard University, Apr. 23.
- 2014 Mathematical Physics and Probability Seminar, University of California Davis, Nov. 17.
 Probability Seminar, University of Kansas, Nov. 12.
 Probability Seminar, University of California Berkeley, Oct. 29.
 PIMS/MPrime Summer School in Probability, University of British Columbia, Jun. 20.
 Gradient random fields workshop, Warwick EPSRC Symposium on Statistical Mechanics, May 27.
- 2012 Feza Gürsey Summer School in Mathematical Physics, Feza Gürsey Institute, Jun. 25.
 PIMS/MPrime Summer School in Probability, University of British Columbia, Jun. 14.
 Discrete Math Seminar, University of British Columbia, Mar. 27.
- 2011 Applied Math and Mathematical Physics Seminar, University of Saskatchewan, Dec. 20.

Conferences, Workshops, & Programs

- 2018 University of Bristol workshop “High-dimensional critical phenomena in random environments”, Sep. 24 – Sep. 26.
 Isaac Newton Institute for the Mathematical Sciences program “Scaling limits, rough paths, quantum field theory”, Sep. 3 – Dec. 21.
 Montréal summer workshop “Challenges in probability and mathematical physics”, Jul. 8 – Jul. 20.
 Göteborg workshop “Probabilistic Approaches to Quantum Spin Systems”, Apr. 16 – Apr. 20.
 University of Bristol conference “Probability, Analysis, and Dynamics ’18”, Apr. 4 – Apr. 6.
 Oberwolfach workshop “Strongly Correlated Random Interacting Processes”, Jan. 28 – Feb. 3.
- 2017 Heilbronn Annual conference, Sep. 14 – Sep. 15.
 Oberwolfach Mini-workshop “Cluster Expansions: From Combinatorics to Analysis through Probability”, Feb. 5 – Feb. 11.
- 2016 Bay Area Discrete Math Day #33, Oct. 1.
 Banff International Research Station / Casa Matemática Oaxaca workshop “Random Structures in High Dimensions”, Jun. 26 – Jul. 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”, Jan. 11 – May 13.
- 2015 Joint UC Davis / University of Warwick probability workshop, Dec. 14–16.

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

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

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

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

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

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

2012 Feza Gürsey Summer School, Jun. 20 – Jul. 7.

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

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

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

Service and Activities

2018 Organizer of the workshop “High-dimensional critical phenomena in random environments” at the University of Bristol.

2017 – 2018+ Co-organizer of the University of Bristol probability seminar

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

Spring 2016 Co-organizer 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 Committee member for the Pacific Institute for Mathematics Sciences Young Researcher’s Conference.

Personal Information

Canadian citizen.