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**Employment**

- 07/19 – Assistant Professor, McMaster University, Department of Mathematics  
01/17 – 06/19 Acting assistant professor, University of Washington, Department of Mathematics  
07/18 Instructor, MathILy-Er summer program  
01/14 – 12/16 Postdoctoral research assistant, University of Oxford, Department of Statistics  
Project: *Tree-valued random processes: tree growth, pruning and stationary processes in the space of continuum trees.* Supervised by Matthias Winkel.

**Education**

- 09/08 – 12/13 University of California, Berkeley, Ph.D. in mathematics  
Thesis: *Instruction sets for walks and the quantile path transformation.* Advised by Jim Pitman.  
09/04 – 05/08 Oberlin College, BA in mathematics (with highest honors) and physics  
Fall '06 Budapest Semesters in Mathematics, studied discrete math and problem solving

**Research and Writing****Interests**

Probability theory, focused on random combinatorial structures and their continuum limits or analogues. Continuum random trees; exchangeability; excursion and fluctuation theory of random walks and Lévy processes, including Brownian motion; path decompositions and transformations.

**Publications and preprints**

- 12) With S. Pal, D. Rizzolo, and M. Winkel (P-R-W). “Diffusions on a space of interval partitions: Poisson-Dirichlet stationary distributions.” ArXiv:1910.07626 [math.PR]. Submitted to *Annals of Probability*. 50 pp.  
11) With P-R-W. “Diffusions on a space of interval partitions: construction from marked Lévy processes.” ArXiv:1909.02584 [math.PR]. Submitted to *Electronic Journal of Probability*. 60 pp.  
10) With P-R-W. “Metrics on sets of interval partitions with diversity.” ArXiv:1907.02132 [math.PR]. In revisions with *Electronic Communications in Probability*. 12 pp.  
9) With P-R-W. “Aldous diffusion I: A projective system of continuum k-tree evolutions.” ArXiv:1809.07756 [math.PR]. 37 pp.  
8) With P-R-W. “Interval partition evolutions with emigration related to the Aldous diffusion.” ArXiv:1804.01205 [math.PR]. 37 pp.  
7) With P-R-W. “Projections of the Aldous chain on binary trees: intertwining and consistency.” ArXiv:1802.00862 [math.PR]. To appear in *Random Structures and Algorithms*. 26 pp.  
6) “Mass-structure of weighted real trees.” ArXiv:1801.02700 [math.PR]. In revisions with *Electronic Journal of Probability*. 30 pp.

- 5) “Brownian bricklayer: a random space-filling curve.” *Statistics & Probability Letters*, 143:43-46, 2018.
- 4) With C. Haulk and J. Pitman. “A representation of exchangeable hierarchies by sampling from random real trees.” *Probability Theory and Related Fields*, 172(1): 1-29, 2018.
- 3) With P-R-W. “Diffusions on a space of interval partitions with Poisson-Dirichlet stationary distributions.” ArXiv:1609.06706 [math.PR]. 78 pp.
- 2) With P-R-W. “Uniform control of local times of spectrally positive stable processes.” *Annals of Applied Probability*, 28(4):2592-2634, 2018.
- 1) With S. Assaf and J. Pitman. “The quantile transform of simple random walk and Brownian motion.” *Electronic Journal of Probability*, 20:1-39, 2015.

### **Papers in progress**

- With P-R-W. “Aldous diffusion II: Properties of the continuum-tree-valued process.”
- With P-R-W. “A two-parameter family of measure-valued diffusions with Poisson-Dirichlet stationary distributions.”
- With J. Pitman. “Stacked instructions for finite-length walks.”
- With D. Rizzolo. “Brownian excursions and local times.”

### **Early projects & experience**

- “Elementary inequalities in additive combinatorics and the Balog-Szemerédi-Gowers Theorem.” Undergraduate thesis supervised by E. Wilmer, Oberlin College, 2008.
- “A bigraded chain complex that generates the Bollobás-Riordan-Tutte polynomial.” REU project supervised by N. Stoltzfus and J. W. Hoffman, Louisiana State University, 2007.
- “A characterization of the spanning trees of undirected Cayley graphs.” REU project supervised by N. Stoltzfus and J. W. Hoffman, Louisiana State University, 2007.
- Software project: wrote code to draw tessellations in various models of hyperbolic geometry. Supervised by W. Goldman, University of Maryland, College Park, 2006.

### **Computer programming**

Experience coding in R, Python, C++, Java, Basic, Pascal, Mathematica, LaTeX, other languages.

### **Academic & Teaching Awards**

2014	UC, Berkeley	Nikki Kose Memorial Teaching Prize (math department)
2012	UC, Berkeley	Outstanding GSI (Graduate Student Instructor) award
2012	UC, Berkeley	Math departmental spring fellowship
2008	Oberlin College	Rebecca Cary Orr math prize for most outstanding graduating senior
2007, 2008	Oberlin College	John D. Baum prize for top Oberlin score on the Putnam competition
2007	NSF	Research Experience for Undergraduates (REU) fellowship to study at Louisiana State U for a summer.

### **Mentoring Experience**

- 01/19-06/19 WXML undergrad research on “Simulation of the reseating Chinese Restaurant process” with Marques Chacon, Zoheb Siddiqui, and Nile Wynar
- 04/17-06/17 WXML undergrad research on “Simulation of the reseating Chinese Restaurant process” with Rey Chou, Alex Forney, and Chengning Li

## Teaching Experience

### McMaster University

Winter '20 STAT / CSE 790: Statistical learning

### University of Washington

<i>Term</i>	<i>Course</i>	<i>Median (mean) student eval, 0-5 scale</i>
Spring '19	Probability theory I (math 394)	4.3 (4.0)
Winter '19	Real analysis II (math 424)	4.5 (4.2)
Fall '18	TA for Probability theory I	(No evals collected)
Spring '18	Measure theory (math 426)	4.7 (4.7)
Fall '17	Probability theory I	4.5 (4.1)
Spring '17	Advanced multivariable calculus (math 324)	(No evals collected)
Winter '17	Continuum random trees (math 582G)	(No evals collected)

### MathILy-ER summer program

Summer '18 Three one-week mini-courses for interested high school students on:

- algorithms & complexity,
- automata and Turing machines,
- exchangeable random sequences and structures.

### University of Oxford

Fall '15 Lecturer for Communication Theory (3<sup>rd</sup> year course)  
09/14 – 03/16 Lecturer at Trinity College, Oxford; biweekly two- or three-on-one tutorials in

- 1<sup>st</sup> year probability, statistics, and convex optimization; and
- 2<sup>nd</sup> year probability, statistics, measure theory, and graph theory.

### University of California, Berkeley

<i>Term</i>	<i>Role</i>	<i>Course</i>	<i>Mean student eval, 1-7 scale</i>
Fall '13	GSI (TA)	Advanced linear algebra (math 110)	6.2
Summer '13	Lecturer	Discrete math (math 55)	6.2
Fall '12	GSI	Lin algebra & diff eqns (math 54)	6.2
Fall '11	GSI	Multivariable calculus (math 53)	6.8
Summer '11	Lecturer	Discrete math	6.1
Spring '11	GSI	Discrete math	6.2
Fall '10	GSI	Discrete math	6.1
Spring '10	GSI	Multivariable calculus	6.2
Fall '09	GSI	Multivariable calculus	5.5
Summer '09	Grader	Discrete math	N/A
Spring '09	GSI	Calculus II, non-major track (math 16B)	5.5
Fall '08	GSI	Calculus I (math 1A)	5.2

### Oberlin College

General math tutor; hosted study hall 3 semesters  
Grader: Number theory, Introduction to analysis

### Other service

Winter and Fall '17, Spring '18, co-organized University of Washington Probability seminar.  
Fall '17, University of Washington, co-organized Putnam exam practice sessions.  
Fall '14, University of Oxford, evaluated masters theses in probability and statistics; co-examined a doctoral student for transfer of status (like an oral qual or preliminary thesis defense).

Fall '11, organizer at Julia Robinson Mathematics Festival (for middle and high school students), Palo Alto, CA.

## Talks

### The Aldous diffusion problem; Poisson-Dirichlet (interval partition) diffusions

- 02/2019 *Probability seminar, University of Washington.* The diffusion analogue to a tree-valued Markov chain.
- 02/2019 *McMaster University.* The diffusion analogue to a tree-valued Markov chain.
- 12/2018 *Statistics department seminar, Rutgers University.* The diffusion analogue to a tree-valued Markov chain.
- 12/2018 *Probability seminar, University of Oregon.* The diffusion analogue to a tree-valued Markov chain.
- 11/2018 *Probability seminar, University of British Columbia.* The diffusion analogue to a tree-valued Markov chain.
- 11/2018 *Probability seminar, UC Irvine.* The diffusion analogue to a tree-valued Markov chain.
- 11/2018 *Probability seminar, UC San Diego.* The diffusion analogue to a tree-valued Markov chain.
- 11/2018 *Colloquium lecture, University of Nevada, Reno.* The diffusion analogue to a tree-valued Markov chain.
- 10/2018 *PIMS PTCS retreat.* Construction of a continuum-tree-valued process conjectured by Aldous.
- 03/2018 *Dynamics seminar, University of Victoria.* Projections of a random walk on a space of binary trees.
- 02/2018 *Probability seminar, University of British Columbia.* Projectively consistent random walks on a space of trees with integer edge weights.
- 01/2018 *Combinatorics seminar, University of Washington.* Projectively consistent random walks on a space of trees with integer edge weights.
- 11/2017 *Probability seminar, University of Delaware.* Random walks on a space of trees with integer edge weights.
- 03/2017 *Probability seminar, University of Maryland.* Stationary diffusions on a space of interval partitions.
- 03/2017 *Stochastic Processes Conference, University of Virginia.* Stationary diffusions on a space of interval partitions.
- 11/2016 *Probability seminar, University of Oxford.* Stationary diffusions on a space of interval partitions.
- 11/2016 *Pacific Northwest probability seminar.* Stationary diffusions on a space of interval partitions.
- 09/2016 *PIMS PTCS retreat.* Stationary diffusions on a space of interval partitions.
- 01/2016 *UNC, Chapel Hill.* Exchangeability and continuum random trees.
- 12/2014 *Junior probability seminar, University of Oxford.* Discrete Aldous diffusion.

### Exchangeable hierarchies; mass-structure of continuum trees

- 10/2019 *Statistics Seminar, McMaster University.* Exchangeability and random hierarchies.
- 09/2019 *Probability Seminar, University of Delaware.* Exchangeability and random hierarchies.
- 02/2019 *University of Nevada, Reno.* Exchangeability and random hierarchies.
- 01/2018 *Probability seminar, University of Washington.* Exchangeable hierarchies and mass-structure of continuum random trees.
- 10/2017 *PIMS PTCS retreat.* Kingman-type description of exchangeable hierarchies.
- 04/2017 *Probability seminar, UC Berkeley.* Kingman-type description of exchangeable hierarchies.
- 03/2016 *Junior probability seminar, University of Oxford.* Kingman-type description of exchangeable hierarchies.

### **The quantile transform; stacked instructions for walks**

- 06/2015 *Graduate lecture, University of Oxford statistics.* Stacked instructions for finite length walks.
- 04/2015 *Probability seminar, University of Bath.* The quantile rearrangement of random walk and Brownian motion increments.
- 01/2015 *Probability seminar, Queen Mary University of London.* The quantile rearrangement of random walk and Brownian motion increments.
- 06/2014 *Combinatorial stochastic processes conference, UC San Diego.* The quantile transform of Brownian motion.
- 02/2014 *Probability seminar, University of Oxford.* The quantile rearrangement of random walk and Brownian motion increments.
- 02/2013 *Probability seminar, UC Berkeley.* The quantile rearrangement of random walk increments.
- 12/2012 *Mathematical Physics and Probability seminar, UC Davis.* The quantile rearrangement of random walk increments.
- 02/2012 *Combinatorial stochastic processes (CSP) seminar, UC Berkeley.* A combinatorial proof of Jeulin's local time theorem.

### **Expository and teaching talks**

- 03/2019 *University of Washington Math Day.* Pólya's urn and exchangeability.
- 07/2017 *SIMUW summer program.* Pólya's urn and exchangeability.
- 07/2017 *Mathily-er summer program.* Pólya's urn and exchangeability.
- 10/2015 *Oberlin College.* Urn schemes, Chinese restaurants, and a walk on tree-space.
- 06/2014 *Graduate lecture, University of Oxford statistics.* Nested Chinese restaurants in a continuum random tree.
- 06/2014 *The Network seminar, University of Oxford statistics.* Brownian excursion theory.
- 09/2011 *Combinatorial stochastic processes (CSP) seminar, UC Berkeley.* Random algorithms on matroids.
- 01/2011 *CSP seminar.* Lovász local lemma.
- 11/2010 *CSP seminar.* Asymptotics of eigenvalues of real Wigner matrices.
- 03/2010 *CSP seminar.* The density Hales-Jewett theorem and massively collaborative mathematics.
- 10/2009 *Many Cheerful Facts seminar, UC Berkeley.* Random graphs of high girth and chromatic number.
- 08/2007 *Young Mathematicians' Conference, Ohio State U.* A new invariant of dessins.