

Tobias Lee Johnson

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EMPLOYMENT AND EDUCATION

Assistant Professor , College of Staten Island (CUNY)	Fall 2017–
NSF Postdoctoral Fellow	
New York University; sponsored by Gérard Ben Arous	Fall 2016–Spring 2017
University of Southern California; sponsored by Larry Goldstein	Fall 2014–Spring 2016
Ph.D. in Mathematics , University of Washington	Fall 2008–Spring 2014
Advised by Ioana Dumitriu and Soumik Pal	
B.A. in Mathematics , Yale University	Fall 2003–Spring 2007

RESEARCH

Interests:

probability theory and combinatorics, with a focus on discrete random structures and interacting particle systems; Stein's method

Papers:

20. *Diffusion-limited annihilating systems and the increasing convex order*, with Riti Bahl, Philip Barnet, and Matthew Junge.
Submitted. arXiv:2104.12797
19. *Particle density in diffusion-limited annihilating systems*, with Matthew Junge, Hanbaek Lyu, and David Sivakoff.
Preprint. arXiv:2005.06018
18. *Continuous phase transitions on Galton–Watson trees*.
Submitted. arXiv:2007.13864
- 2020 17. *Random tree recursions: which fixed points correspond to tangible sets of trees?*, with Moumanti Podder and Fiona Skerman.
Random Structures Algorithms, 56(3):796–837, 2020. arXiv:1808.03019
- 2019 16. *Cover time for the frog model on trees*, with Christopher Hoffman and Matthew Junge.
Forum Math. Sigma, 7, e41 1–49, 2019. arXiv:1802.03428
15. *Infection spread for the frog model on trees*, with Christopher Hoffman and Matthew Junge.
Electron. J. Probab., 24 (2019), no. 112, 1–29. arXiv:1710.05884
14. *Sensitivity of the frog model to initial conditions*, with Leonardo T. Rolla.
Electron. Commun. Probab., 24 (2019), no. 29, 1–9. arXiv:1809.03082
- 2018 13. *Stochastic orders and the frog model*, with Matthew Junge.
Ann. Inst. H. Poincaré Probab. Statist., 54(2):1013–1030, 2018. arXiv:1602.04411.
12. *Bounds to the normal for proximity region graphs*, with Larry Goldstein and Raphaël Lachièze-Rey.
Stochastic Process. Appl., 128(4):1208–1237, 2018. arXiv:1510.09188.
11. *Size biased couplings and the spectral gap for random regular graphs*, with Nicholas Cook and Larry Goldstein.
Ann. Probab., 46(1):72–125, 2018. arXiv:1510.06013.
- 2017 10. *Recurrence and transience for the frog model on trees*, with Christopher Hoffman and Matthew Junge.
Ann. Probab., 45(5):2826–2854, 2017. arXiv:1404.6238.
9. *Local limit of the fixed point forest*, with Anne Schilling and Erik Slivken.
Electron. J. Probab., 22 (2017), no. 18, 1–26. arXiv:1605.09777.
- 2016 8. *The critical density for the frog model is the degree of the tree*, with Matthew Junge.
Electron. Commun. Probab., 21 (2016), no. 82, 1–12. arXiv:1607.07914.
7. *From transience to recurrence with Poisson tree frogs*, with Christopher Hoffman and Matthew Junge.
Ann. Appl. Probab., 26(3):1620–1635, 2016. arXiv:1501.05874.
6. *The Marčenko–Pastur law for sparse random bipartite biregular graphs*, with Ioana Dumitriu.
Random Structures Algorithms, 48(2):313–340, 2016. arXiv:1304.4907.
- 2015 5. *Exchangeable pairs, switchings, and random regular graphs*.
Electron. J. Combin., 22(1):P1.33, 2015. arXiv:1112.0704.

4. *Quantitative small subgraph conditioning*, with Elliot Paquette. Unpublished. arXiv:1307.4858.
- 2014 3. *Cycles and eigenvalues of sequentially growing random regular graphs*, with Soumik Pal. *Ann. Probab.*, 42(4):1396–1437, 2014. arXiv:1203.1113.
- 2013 2. *Functional limit theorems for random regular graphs*, with Ioana Dumitriu, Soumik Pal, and Elliot Paquette. *Probab. Theory Related Fields*, 156(3–4):921–975, 2013. arXiv:1109.4094.
- 2009 1. *On universal cycles for multisets*, with Glenn Hurlbert and Joshua Zahl. *Discrete Math.*, 309::5321–5327, 2009. arXiv:math/0701488.

GRANTS, HONORS, AND AWARDS

PSC-CUNY Grant , Award #62628-00 50	2019–2020
NSF Grant, Standard Grant, Probability , Award DMS-1811952	2018–2021
PSC-CUNY Grant , Award #61540-00 49	2018–2019
NSF Postdoctoral Fellow , University of Southern California and Courant Institute	2014–2017
ARCS Fellowship , ARCS Foundation, Seattle chapter	2008–2010
NSF VIGRE Graduate Fellowship , University of Washington	2008–2009

TALKS

AMS Eastern Sectional , online <i>Continuous phase transitions on Galton-Watson trees</i>	March 2021
Northwestern University , Probability Seminar <i>Two-type diffusion-limited annihilating systems</i>	February 2020
CUNY , Probability Seminar <i>Two-type diffusion-limited annihilating systems</i>	October 2019
CUNY , Graduate Student Colloquium <i>The frog model and other processes in discrete probability</i>	April 2019
AMS Eastern Sectional , Delaware <i>Fixed points of random tree recursions</i>	September 2018
University of Massachusetts Amherst , Discrete Math Seminar <i>The frog model on trees</i>	September 2018
City College , Colloquium <i>The frog model on trees</i>	September 2018
Indiana University , Probability Seminar <i>Fixed points of recursive functions on Galton-Watson trees</i>	September 2018
CIMPA School, Geometry and scaling of random structures , Buenos Aires <i>Cover time for the frog model on trees</i>	July 2018
Georgia Tech , Stochastics Seminar <i>Cover time for the frog model on trees</i>	February 2018
CUNY , Probability Seminar <i>Size biased couplings and the spectral gap for random regular graphs</i>	October 2017
Penn/Temple , Probability Seminar <i>Galton-Watson fixed points, tree automata, and interpretations</i>	April 2017
University of Minnesota , Probability Seminar <i>Cover time for the frog model on trees</i>	March 2017
NYU-ECNU (Shanghai) , Probability Seminar <i>Cover time for the frog model on trees</i>	March 2017
Columbia University , Probability Seminar <i>Galton-Watson fixed points, tree automata, and interpretations</i>	February 2017
Duke University , Probability Seminar <i>Galton-Watson fixed points, tree automata, and interpretations</i>	February 2017
University of Chicago , Probability and Statistical Physics Seminar <i>Galton-Watson fixed points, tree automata, and interpretations</i>	February 2017
Purdue University , Probability Seminar <i>Galton-Watson fixed points, tree automata, and interpretations</i>	January 2017
Ohio State University , Combinatorics and Probability Seminar <i>Galton-Watson fixed points, tree automata, and interpretations</i>	December 2016
Rutgers , Discrete Math Seminar <i>The frog model on trees</i>	September 2016

Carnegie Mellon University , Algorithms, Combinatorics and Optimization Seminar <i>Size biased couplings and the spectral gap for random regular graphs</i>	May 2016
Bay Area Discrete Math Day , UC Berkeley <i>The frog model on trees</i>	April 2016
Simons Institute (Berkeley) , Counting Program Seminar <i>Nonexistent properties of Galton–Watson trees</i>	April 2016
Stanford University , Probability Seminar <i>Size biased couplings and the spectral gap for random regular graphs</i>	March 2016
Cornell University , Oliver Club (Colloquium) <i>The frog model on trees</i>	March 2016
Courant Institute , Probability Seminar <i>The frog model on trees</i>	March 2016
UT Austin , Random Structures Seminar <i>Size biased couplings and the spectral gap for random regular graphs</i>	February 2016
UC Irvine , Probability Seminar <i>Size biased couplings and the spectral gap for random regular graphs</i>	January 2016
Davis–Warwick Probability Workshop , UC Davis <i>Size biased couplings and the spectral gap for random regular graphs</i>	December 2015
UCLA , Probability Seminar <i>Size biased couplings and the spectral gap for random regular graphs</i>	October 2015
Yale University , Combinatorics and Probability Seminar <i>The second eigenvalue of dense random regular graphs</i>	September 2015
Rutgers , Discrete Math Seminar <i>The second eigenvalue of dense random regular graphs</i>	September 2015
Penn/Tempel , Probability Seminar <i>The frog model on trees</i>	September 2015
CUNY , Probability Seminar <i>The frog model on trees</i>	September 2015
Sherman Memorial Conference , Indiana University <i>The frog model on trees</i>	May 2015
UC Davis , Mathematical Physics & Probability Seminar <i>The frog model on trees</i>	May 2015
IMA , Postdoc Seminar <i>The frog model on trees</i>	April 2015
Weizmann Institute , Geometric Functional Analysis & Probability Seminar <i>The frog model on trees</i>	March 2015
UCLA , Probability Seminar <i>Random matrices, random regular graphs, and Stein’s method</i>	February 2015
UC Irvine , Probability Seminar <i>The frog model on trees</i>	February 2015
Southern California Probability Symposium , UCLA <i>The frog model on trees</i>	December 2014
AMS Special Session on Random Matrices , Joint Meetings, Baltimore <i>Random matrices and random regular graphs</i>	January 2014
University of Southern California , Probability Seminar <i>Stein’s method and random regular graphs</i>	September 2013
Courant Institute , Probability Seminar <i>Growing random regular graphs and the Gaussian free field</i>	April 2012

PROFESSIONAL ACTIVITIES

- reviewer for *ALEA*, *Annals of Probability*, *Communications on Pure and Applied Mathematics*, *Journal of Integer Sequences*, *Probability Theory and Related Fields*, *Random Structures and Algorithms*, and *Symposium on Discrete Algorithms*
- reviewer for AMS MathSciNet
- organized USC’s Probability /Statistics Seminar

TEACHING

Classes taught:

Probability (MTH 311, CSI)
 Statistics (MTH 214, CSI)

Fall 2017, Fall 2018, Spring 2021
 Fall 2017, Spring 2018, Fall 2019, Spring 2021

Calculus I (MTH 231, CSI)	<i>Spring 2018, Fall 2019</i>
Calculus II (MTH 232, CSI)	<i>Fall 2020</i>
Analysis (MATH 325, NYU)	<i>Spring 2017</i>
Math for Economics II (MATH 212, NYU)	<i>Fall 2016</i>
Business Calculus (MATH 118x, USC)	<i>Fall 2014</i>
Differential Equations (MATH 307, UW)	<i>Winter 2014</i>
Linear Algebra (MATH 308, UW)	<i>Winter 2011, Summer 2011, Spring 2013</i>
Calculus I (MATH 124, UW)	<i>Summer 2010</i>

Other teaching duties:

Lead TA, University of Washington Trained and supervised all first-year teaching assistants	<i>Fall 2012–Spring 2013</i>
TA Mentor, University of Washington Observed and advised first-year teaching assistants	<i>Fall 2010, Fall 2011</i>
TA for calculus classes, University of Washington	<i>Fall 2008, Spring 2009, Fall 2010, Fall 2011</i>