

Antonio Auffinger

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Education

Ph.D. Mathematics, New York University - USA, 2011.

M.S. Mathematics, Impa - Brazil, 2006.

B.S. in Mathematics, Universidade Federal do Espirito Santo - Brazil, 2004.

Employment

Northwestern University

Associate Professor, 2017-present

Assistant Professor, 2014-2017

University of Chicago

L.E. Dickson Instructor, 2011-2014

New York University

Research/Teaching Assistant, 2007-2011.

Fields of Interest

Probability Theory: spin glasses, growth models and random matrices.

Honors, Awards, & Fellowships

NSF CAREER Grant DMS-1653552, Jul 2017-Jul 2022, "Complexity of Disordered Systems": \$499,999.

NSF Grant DMS-1407554 (Jul 2014- Jun 2017): 'Complexity of Disordered Systems', \$ 144,078.

NSF Grant DMS-1707943: "Dynamics, aging and universality in complex systems", \$ 49,000 (Co-PI: Paul Bourgade, Ivan Corwin, Alice Guionnet)

NSF Grant DMS-1542289 Jan 2016 - Jul 2016, "Emphasis Year in Probability", \$ 40,000 (Co-PI: Elton Hsu).

Gold award by ICCM, 2017 - “for the best paper in mathematics in the last five years”.

Francisco Aranda-Ordaz Prize, sponsored by the Bernoulli Society, 2012.

Wilhelm T. Magnus Memorial Prize, 2011 - “for Significant Contributions to Mathematical Sciences”.

McCracken Fellowship, New York University, 2007-2011.

Research

Preprints and Journal Publications

28. Antonio Auffinger, Aukosh Jagannath. *On spin distributions for generic p -spin models*, arXiv:1802.07291.
27. Antonio Auffinger, Qiang Zeng. *Existence of two-step replica symmetry breaking for the spherical mixed spin glass at zero temperature*, arXiv:1802.02991.
26. Antonio Auffinger, Dylan Cable. *Pemantle’s min-plus binary tree*, arXiv:1709.07849.
25. Antonio Auffinger, Wei-Kuo Chen. *On concentration properties of disordered Hamiltonians*. Proc. Amer. Math. Soc. 146 (2018), no. 4, 1807–1815.
24. Antonio Auffinger, Wei-Kuo Chen, Qiang Zeng. *The SK model is Full-Step Replica Symmetry Breaking at zero temperature*, arXiv:1703.06872.
23. Antonio Auffinger, Wei-Kuo Chen. *On the energy landscape of spherical spin glasses*, arXiv:1702.08906.
22. Antonio Auffinger, Aukosh Jagannath. *Thouless-Anderson-Palmer equations for conditional Gibbs measures in the generic p -spin glass model*, arXiv:1612.06359.
21. Antonio Auffinger, Wei-Kuo Chen. *Parisi formula for the ground state energy in the mixed p -spin model*, Annals of Probability. 45 (2017), no. 6B, 4617–4631
20. Antonio Auffinger, Wei-Kuo Chen. *A duality principle in spin glasses*, Electron. J. Probab., Vol 22 (2017), no. 61, 17 pp.
19. Antonio Auffinger, Si Tang. *On the time constant of high dimensional first passage percolation*. Elect. Journal of Probab. Vol. 21, no. 24. 2016.
18. Antonio Auffinger, Wei-Kuo Chen. *The Legendre structure of the Parisi formula*. Comm. in Math. Physics, Volume 348, Issue 3, pp 751–770, 2016.
17. Antonio Auffinger, Michael Damron, Jack Hanson. *50 years of first passage percolation*. University Lecture Series, Volume: 68; 2017; 161 pp.
16. Antonio Auffinger, Si Tang. *Extreme eigenvalues of sparse, heavy tailed random matrices*. Stoc. Proc. and Applications, Volume 126, Issue 11, November 2016, Pages 3310–3330.
15. Antonio Auffinger, Wei-Kuo Chen. *Universality of chaos and ultrametricity in mixed p -spin glasses.*, Comm. on Pure and Applied Mathematics, Vol. LXIX, 2107–2130 (2016).
14. Antonio Auffinger, Michael Damron and Jack Hanson. *Rate of convergence of the mean for sub-additive ergodic sequences*. Adv. in Math. Volume 285, 5 November 2015, Pages 138–181.

13. Antonio Auffinger, Wei-Kuo Chen. *The Parisi formula has a unique minimizer*. Comm. in Math. Phys., May 2015, Volume 335, Issue 3, pp 1429–1444.
12. Antonio Auffinger, Wei-Kuo Chen. *On properties of Parisi measures*. Probab. Theory and Rel. Fields. 2015, Vol. 161, Issue 3, pp 817-850.
11. Antonio Auffinger, Michael Damron and Jack Hanson. *Limiting geodesics for first-passage percolation on subsets of \mathbb{Z}^2* , Annals of Applied Probability Volume 25, Number 1 (2015), 373-405.
10. Antonio Auffinger, Wei-Kuo Chen. *Complexity and free energy of bipartite mean field spin glasses*, Journal of Stat. Phys. 2014, Volume 157, Issue 1, pp 40-59.
9. Antonio Auffinger, Michael Damron. *A simplified proof of the relation between scaling exponents in first-passage percolation*, Annals of Probability 2014, Vol. 42, No. 3, 1197-1211.
8. Antonio Auffinger, Michael Damron. *The universal scaling relation for polymers in a random environment and related models*, ALEA, Lat. Am. J. Probab. Math. Stat. 10 (2), 857-880 (2013).
7. Antonio Auffinger, Gerard Ben Arous. *Complexity of random smooth functions of many variables*, Annals of Probability 2013, Vol. 41, No. 6, 4214-4247.
6. Antonio Auffinger, Michael Damron. *Differentiability at the edge of the limit shape and related results in first passage percolation*, Probab. Theory and Rel. Fields, Vol. 156, Issue 1-2, pp 193-227, June 2013.
5. Antonio Auffinger, Gerard Ben Arous and Jiri Cerny. *Random matrices and complexity of spherical spin glasses*, Comm. on Pure and Applied Mathematics, Volume 66, Issue 2, pages 165-201, February 2013.
4. Antonio Auffinger, Oren Louidor. *Directed polymers in random environment with heavy tails*. Comm. on Pure and Applied Mathematics, Volume 64, Issue 2, pages 183-204, February 2011.
3. Antonio Auffinger, Gerard Ben Arous and Sandrine Peche. *Poisson convergence for the largest eigenvalues of Heavy Tailed Random Matrices*. Annales de l'Institut Henri Poincare Volume 45 no. 3 pg. 589-610 2009.
2. Antonio Auffinger, Jinho Baik and Ivan Corwin *Universality for directed polymer in thin rectangles*, *arXiv1204.4445*
1. *Random Matrices, Complexity of Spin Glasses and Heavy Tailed Processes Ph.D. thesis, May 2011.*

Invited Talks and Minicourses

100+ invited talks from July 2010-December 2017 – List upon request.

Editorial Service

Grant proposal reviewer for NSF-DMS Probability and NSA.

Peer refereed:

ACTA, Annals of Applied Probability, Annals of Mathematics, Annals of Probability, Communication in Mathematical Physics, Comm. in Pure and Applied Mathematics, Duke Mathematical Journal, Electronic Communications in Probability, Electronic Journal of Probability, Journal of Statistical Physics, Probability Theory and Related Fields, SPA, Statistics and Probability Letters, among others.

Reviewed articles for Mathscinet

Reviewed book for the American Math. Society - Upper and Lower Bounds for stochastic processes - to appear at Bulletin of the AMS.

Organized conferences, workshops and seminars

SPA 2019, Northwestern University, July 2019 (co-organizer, local committee).

2nd Summer school in probability - Northwestern University, July 2018. (co-organizer with Elton Hsu)

Spin glasses and related topics, Banff, October 2018 (co-organizer with Wei-Kuo Chen, Dmitry Panchenko, Lenka Zdeborova)

Conference on dynamics and disordered media, Courant institute - July 2017 (co-organizer with Paul Bourgade, Ivan Corwin and Alice Guionnet)

Special session in spin glasses and disordered media - AMS, National meeting, January 2017 (co-organizer with Aukosh Jagannath and Dmitry Panchenko)

Summer school in probability - Northwestern University, July 2016. (co-organizer with Elton Hsu)

Workshop in spin glasses, percolation and random media - Northwestern University, May 2016. (co-organizer with Elton Hsu)

AMS sectional session in probability theory (co-organizer with Jian Ding and Sebastien Roch) - October 2015.

Emphasis year in Probability at Northwestern - 2015/2016 (co-organizer with Elton Hsu).

Workshop on First passage percolation and related models, AIM - August 2015. (co-organizer with M. Damron and Jack T. Hanson).

36, 37 and 38th Midwest probability colloquium - October 2014-2017 (co-organizer, local committee).

35th Midwest probability colloquium - October 2013 (co-organizer, scientific committee).

Probability seminar at Northwestern, co-organizer, 2014-present.

Probability seminar at Univ. of Chicago, co-organizer, 2011-2014.

Academic Service

Northwestern University, Evanston, USA

Colloquium committee (2014/2015), Boas committee (2015/16, 2016/17 - chair), Lecture-ship committee (2016/17 - chair), Budget committee (2016,2017), Emphasis year committee (2015/16), Undergraduate prize award committee (2016), Bellow/Pinsky lecture committee (2016/17 - chair), Graduate admission committee (2017/18).

Languages Spoken

English, French and Portuguese - Fluent.