

Alexander S. Wein

CONTACT INFORMATION	Courant Institute of Mathematical Sciences Department of Mathematics New York University	awein@cims.nyu.edu https://cims.nyu.edu/~aw128/ Office: Warren Weaver Hall 827
RESEARCH INTERESTS	Theoretical computer science, mathematics of data science.	
APPOINTMENTS	Courant Institute, Department of Mathematics, New York University <i>Assistant Professor/Courant Instructor</i> , 2018 – present	
EDUCATION	Massachusetts Institute of Technology Ph.D. in Mathematics, June 2018 <ul style="list-style-type: none">• Advisor: Ankur Moitra California Institute of Technology B.S. in Computer Science and Mathematics (with honors), June 2013 <ul style="list-style-type: none">• Class rank: 4 of 243; 1 of 34 in Computer Science	
HONORS/AWARDS	National Defense Science and Engineering Graduate Fellowship, 2014 – 2017. Charles W. and Jennifer C. Johnson Prize, MIT Department of Mathematics, 2018. <i>In recognition of an outstanding mathematics paper accepted for publication in a major journal</i> for paper “Optimality and sub-optimality of PCA I: Spiked random matrix models.”	
PUBLICATIONS	A. S. Bandeira, A. Perry, A. S. Wein. Notes on computational-to-statistical gaps: predictions using statistical physics. <i>Portugaliae Mathematica</i> , to appear. A. Perry, A. S. Wein, A. S. Bandeira, A. Moitra. Message-passing algorithms for synchronization problems over compact groups. <i>Communications on Pure and Applied Mathematics (CPAM)</i> , to appear. A. Perry, A. S. Wein, A. S. Bandeira, A. Moitra. Optimality and sub-optimality of PCA I: Spiked random matrix models. <i>Annals of Statistics</i> , 2018. A. Moitra, W. Perry, A. S. Wein. How Robust are Reconstruction Thresholds for Community Detection? <i>Proceedings of 48th Annual Symposium on the Theory of Computing (STOC 2016)</i> . A. Perry, A. S. Wein. A semidefinite program for unbalanced multisection in the stochastic block model. <i>Proceedings of 12th International Conference on Sampling Theory and Applications (SampTA 2017)</i> .	
PREPRINTS	A. S. Bandeira, B. Blum-Smith, J. Kileel, A. Perry, J. Weed, A. S. Wein. Estimation under group actions: recovering orbits from invariants. <i>arXiv:1712.10163</i> , 2017. A. Perry, A. S. Wein, A. S. Bandeira. Statistical limits of spiked tensor models. <i>arXiv:1612.07728</i> , 2016.	

A. Perry, A. S. Wein, A. S. Bandeira, A. Moitra. Optimality and Sub-optimality of PCA for Spiked Random Matrices and Synchronization. *arXiv:1609.05573*, 2016.

TALKS

Estimation in the presence of group actions. Workshop on combinatorial statistics. Universite de Montreal. April–May 2018.

Computational invariant theory and MRA (multi-reference alignment) over general groups. Simons Collaboration on Algorithms & Geometry, meeting on MRA and cryo-EM. New York, NY. November 2017.

Message passing algorithms for cryo-EM and synchronization. Broad Institute. Cambridge, MA. November 2017.

Introduction to approximate message passing and the replica method. AIM workshop “Connecting communities via the block model,” American Institute of Mathematics. San Jose, CA. May 2017.

(With A. Perry, A. S. Bandeira) *Lecture series on computational-to-statistical gaps.* Courant Institute, NYU. May 2017.

(Poster) *Non-detection in spiked matrix models.* Workshop on Optimization and Statistical Learning (OSL). Les Houches, France. April 2017.

(Poster) *Non-detection in spiked matrix models.* Workshop on Statistical Physics, Learning, Inference, and Networks. Les Houches, France. February–March 2017.

Optimality and sub-optimality of PCA for spiked random matrix models. Algorithms and Complexity Seminar, MIT. October 2016.

How Robust are Reconstruction Thresholds for Community Detection? Symposium on the Theory of Computing (STOC). June 2016.

How Robust are Reconstruction Thresholds for Community Detection? IDeAS Seminar, Princeton. May 2016.

TEACHING EXPERIENCE

Massachusetts Institute of Technology

Fall 2017 *18.408: Topics in Theoretical Computer Science (Ankur Moitra)*
Teaching assistant

Spring 2016 *18.02: Multivariable Calculus*
Teaching assistant

SERVICE

Reviewed papers for conferences: STOC 2015, FOCS 2017, RANDOM 2017, NIPS 2017, STOC 2018, ICML 2018, COLT 2018, NIPS 2018, SODA 2019.

Reviewed papers for journals: CPAM, IEEE Transactions on Information Theory, IEEE Signal Processing Letters.

Compiled open problem list for workshop “Connecting communities via the block model” at the American Institute of Mathematics. San Jose, CA. May 2017.

Organized MIT applied math graduate student seminar (SPAMS), 2014 – 2015.