

Alexander S. Wein

CONTACT	Department of Mathematics University of California, Davis	aswein@ucdavis.edu www.alex-wein.com
APPOINTMENTS	Department of Mathematics, University of California, Davis <i>Assistant Professor</i> , Fall 2022 – present College of Computing, Georgia Institute of Technology <i>Postdoctoral Fellow</i> , Spring 2022 <ul style="list-style-type: none">• Host: Santosh Vempala Simons Institute for the Theory of Computing, UC Berkeley <i>Simons-Berkeley Research Fellow</i> , Fall 2021 Courant Institute, Department of Mathematics, New York University <i>Assistant Professor/Courant Instructor</i> , Fall 2018 – Spring 2021 With half-time postdoctoral position sponsored by: <ul style="list-style-type: none">• Afonso Bandeira, and• the Simons Collaboration on Algorithms and Geometry	
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	
AWARDS	NSF CAREER Award, 2024 ACHA Charles Chui Young Researcher Best Paper Award, 2023 for paper “Estimation Under Group Actions: Recovering Orbits From Invariants” Sloan Research Fellowship, 2023 Charles W. and Jennifer C. Johnson Prize (student paper award, MIT Math), 2018 for paper “Optimality and Sub-optimality of PCA I: Spiked Random Matrix Models” National Defense Science and Engineering Graduate Fellowship, 2014 – 2017	
SELECT PAPERS	<i>Note: in most cases, authors are listed in alphabetical order</i> Tensor Cumulants for Statistical Inference on Invariant Distributions Dmitriy Kunisky, Cristopher Moore, Alexander S. Wein <i>Symposium on Foundations of Computer Science (FOCS)</i> , 2024 Precise Error Rates for Computationally Efficient Testing Ankur Moitra, Alexander S. Wein <i>Annals of Statistics</i> , to appear	

Is Planted Coloring Easier than Planted Clique?

Pravesh K. Kothari, Santosh S. Vempala, Alexander S. Wein, Jeff Xu
Conference on Learning Theory (COLT), 2023

Is it Easier to Count Communities Than Find Them?

Cynthia Rush, Fiona Skerman, Alexander S. Wein, Dana Yang
Innovations in Theoretical Computer Science (ITCS), 2023

Equivalence of Approximate Message Passing and Low-Degree Polynomials in Rank-One Matrix Estimation

Andrea Montanari, Alexander S. Wein
Probability Theory and Related Fields, 2024

Average-Case Complexity of Tensor Decomposition for Low-Degree Polynomials

Alexander S. Wein
Symposium on Theory of Computing (STOC), 2023

The Franz-Parisi Criterion and Computational Trade-offs in High Dimensional Statistics

Afonso S. Bandeira, Ahmed El Alaoui, Samuel B. Hopkins, Tselil Schramm, Alexander S. Wein, Ilias Zadik
Neural Information Processing Systems (NeurIPS), 2022; oral presentation

Hardness of Random Optimization Problems for Boolean Circuits, Low-Degree Polynomials, and Langevin Dynamics

David Gamarnik, Aukosh Jagannath, Alexander S. Wein
Symposium on Foundations of Computer Science (FOCS), 2020
SIAM Journal on Computing, 2024

Optimal Spectral Recovery of a Planted Vector in a Subspace

Cheng Mao, Alexander S. Wein
Bernoulli, to appear

Optimal Low-Degree Hardness of Maximum Independent Set

Alexander S. Wein
Mathematical Statistics and Learning, 2021

Computational Barriers to Estimation from Low-Degree Polynomials

Tselil Schramm, Alexander S. Wein
Annals of Statistics, 2022

The Kikuchi Hierarchy and Tensor PCA

Alexander S. Wein, Ahmed El Alaoui, Cristopher Moore
Symposium on Foundations of Computer Science (FOCS), 2019

Spectral Methods from Tensor Networks

Ankur Moitra, Alexander S. Wein
Symposium on Theory of Computing (STOC), 2019; invited to *SICOMP special issue*

Estimation Under Group Actions: Recovering Orbits From Invariants

Afonso S. Bandeira, Ben Blum-Smith, Joe Kileel, Amelia Perry, Jonathan Niles-Weed, Alexander S. Wein
Applied and Computational Harmonic Analysis, 2023

SELECT TALKS	10/24	CIMI Toulouse (6-hour mini-course)
	04/24	IDEAL Workshop, Northwestern
	02/24	Yale Department of Statistics and Data Science
	09/23	MIT Stochastics and Statistics Seminar
	05/23	Stanford Applied Math Seminar
	04/23	UChicago Combinatorics and TCS Seminar
	04/23	Waterloo Probability Seminar
	02/23	Stanford CS Theory Lunch
	10/22	CSDM Seminar, Institute for Advanced Study, Princeton NJ
	01/22	Frontiers in Electrical Engineering, Caltech
	10/20	ISL Colloquium, Stanford
	09/20	TCS+
	12/19	WORDS Conference, Fuqua School of Business, Duke University
	11/19	Computer Science Theory Seminar, UIC
	04/19	IDeAS Seminar, Princeton
TEACHING	At University of California, Davis:	
	<i>Calculus (Winter '23), Real Analysis (Winter '23), Probability (Fall '23 & Fall '24), Mathematics of Data Science (Spring '24)</i>	
	At Courant Institute, New York University:	
	<i>Calculus (Fall '18 & Fall '19), Discrete Mathematics (Spring '21)</i>	
SERVICE	Program committees: COLT 2023, STOC 2024, COLT 2024, STOC 2025	
	Senior PC: COLT 2025	
	Editorial board: Mathematical Foundations of Machine Learning (Springer), 2024 –	
	Workshop organizer, American Institute of Mathematics, Dec. 2024 <i>“Low-degree polynomial methods in average-case complexity”</i>	