Stanford

Amir Dembo

Marjorie Mhoon Fair Professor of Quantitative Science, Professor of Statistics and, by courtesy, of Electrical Engineering

Mathematics

Bio

ACADEMIC APPOINTMENTS

- Professor, Mathematics
- Professor, Statistics
- Professor (By courtesy), Electrical Engineering

Teaching

COURSES

2026-27

- Stochastic Calculus: MATH 237 (Win)
- Theory of Probability II: MATH 230B, STATS 310B (Win)

2025-26

- Lebesgue Integration and Fourier Analysis: MATH 172 (Spr)
- Theory of Probability III: MATH 230C, STATS 310C (Spr)

2024-25

- Discrete Probabilistic Methods: MATH 159 (Win)
- Theory of Probability II: MATH 230B, STATS 310B (Win)

2023-24

- Theory of Probability III: MATH 230C, STATS 310C (Spr)
- Topics in Probability: MATH 232 (Spr)

STANFORD ADVISEES

Doctoral Dissertation Advisor (AC)

Ryan Jeong, Jiyun Park, Ruochuan Xu

Doctoral Dissertation Co-Advisor (AC)

Yanxin Zhou

Doctoral (Program)

Rupert Li

Publications

PUBLICATIONS

- **Limit law for the cover time of a random walk on a binary tree** *ANNALES DE L INSTITUT HENRI POINCARE-PROBABILITES ET STATISTIQUES*
  Dembo, A., Rosen, J., Zeitouni, O.
  2021; 57 (2): 830-855
- **Upper tail for homomorphism counts in constrained sparse random graphs** *RANDOM STRUCTURES & ALGORITHMS*
  Bhattacharya, S., Dembo, A.
  2021
- **Diffusions interacting through a random matrix: universality via stochastic Taylor expansion** *PROBABILITY THEORY AND RELATED FIELDS*
  Dembo, A., Gheissari, R.
  2021
- **Averaging Principle and Shape Theorem for a Growth Model with Memory** *COMMUNICATIONS ON PURE AND APPLIED MATHEMATICS*
  Dembo, A., Groisman, P., Huang, R., Sidoravicius, V.
  2020
- **Exponential Concentration for Zeroes of Stationary Gaussian Processes** *INTERNATIONAL MATHEMATICS RESEARCH NOTICES*
  Basu, R., Dembo, A., Feldheim, N., Zeitouni, O.
  2020; 2020 (23): 9769–96
- **Large deviations of subgraph counts for sparse Erdos-Renyi graphs** *ADVANCES IN MATHEMATICS*
  Cook, N., Dembo, A.
  2020; 373
- **Dynamics for Spherical Spin Glasses: Disorder Dependent Initial Conditions** *JOURNAL OF STATISTICAL PHYSICS*
  Dembo, A., Subag, E.
  2020
- **Random walks among time increasing conductances: heat kernel estimates** *PROBABILITY THEORY AND RELATED FIELDS*
  Dembo, A., Huang, R., Zheng, T.
  2019; 175 (1-2): 397–445
- **Criticality of a Randomly-Driven Front** *ARCHIVE FOR RATIONAL MECHANICS AND ANALYSIS*
  Dembo, A., Tsai, L.
  2019; 233 (2): 643–99
- **The infinite Atlas process: Convergence to equilibrium** *ANNALES DE L INSTITUT HENRI POINCARE-PROBABILITES ET STATISTIQUES*
  Dembo, A., Jara, M., Olla, S.
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- **COMPONENT SIZES FOR LARGE QUANTUM ERDOS-RENYI GRAPH NEAR CRITICALITY** *ANNALS OF PROBABILITY*
  Dembo, A., Levit, A., Vadlamani, S.
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- **Cut-off for lamplighter chains on tori: dimension interpolation and Phase transition** *PROBABILITY THEORY AND RELATED FIELDS*
  Dembo, A., Ding, J., Miller, J., Peres, Y.
  2019; 173 (1-2): 605–50
- **LARGE DEVIATIONS THEORY FOR MARKOV JUMP MODELS OF CHEMICAL REACTION NETWORKS** *ANNALS OF APPLIED PROBABILITY*
  Agazzi, A., Dembo, A., Eckmann, J.
  2018; 28 (3): 1821–55
- **Cutoff for lamplighter chains on fractals** *ELECTRONIC JOURNAL OF PROBABILITY*
  Dembo, A., Kumagai, T., Nakamura, C.

2018; 23

- **A large deviation principle for the Erdos-Renyi uniform random graph** *ELECTRONIC COMMUNICATIONS IN PROBABILITY*
  Dembo, A., Lubetzky, E.
  2018; 23
- **EQUILIBRIUM FLUCTUATION OF THE ATLAS MODEL** *ANNALS OF PROBABILITY*
  Dembo, A., Tsai, L.
  2017; 45 (6B): 4529–60
- **EXTREMAL CUTS OF SPARSE RANDOM GRAPHS** *ANNALS OF PROBABILITY*
  Dembo, A., Montanari, A., Sen, S.
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- **FERROMAGNETIC ISING MEASURES ON LARGE LOCALLY TREE-LIKE GRAPHS** *ANNALS OF PROBABILITY*
  Basak, A., Dembo, A.
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- **Nonlinear large deviations** *ADVANCES IN MATHEMATICS*
  Chatterjee, S., Dembo, A.
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- **Large Deviations for Diffusions Interacting Through Their Ranks** *COMMUNICATIONS ON PURE AND APPLIED MATHEMATICS*
  Dembo, A., Shkolnikov, M., Varadhan, S. R., Zeitouni, O.
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  Dembo, A., Tsai, L.
  2016; 341 (1): 219-261
- **Matrix Optimization Under Random External Fields** *JOURNAL OF STATISTICAL PHYSICS*
  Dembo, A., Zeitouni, O.
  2015; 159 (6): 1306-1326
- **NO ZERO-CROSSINGS FOR RANDOM POLYNOMIALS AND THE HEAT EQUATION** *ANNALS OF PROBABILITY*
  Dembo, A., Mukherjee, S.
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- **Monotone interaction of walk and graph: recurrence versus transience** *ELECTRONIC COMMUNICATIONS IN PROBABILITY*
  Dembo, A., Huang, R., Sidoravicius, V.
  2014; 19: 1-12
- **Walking within growing domains: recurrence versus transience** *ELECTRONIC JOURNAL OF PROBABILITY*
  Dembo, A., Huang, R., Sidoravicius, V.
  2014; 19: 1-20
- **The Replica Symmetric Solution for Potts Models on d-Regular Graphs** *COMMUNICATIONS IN MATHEMATICAL PHYSICS*
  Dembo, A., Montanari, A., Sly, A., Sun, N.
  2014; 327 (2): 551-575
- **FACTOR MODELS ON LOCALLY TREE-LIKE GRAPHS** *ANNALS OF PROBABILITY*
  Dembo, A., Montanari, A., Sun, N.
  2013; 41 (6): 4162-4213
- **Limiting spectral distribution of sums of unitary and orthogonal matrices** *ELECTRONIC COMMUNICATIONS IN PROBABILITY*
  Basak, A., Dembo, A.
  2013; 18: 1-19
- **Persistence of iterated partial SUMS** *ANNALES DE L INSTITUT HENRI POINCARE-PROBABILITES ET STATISTIQUES*
  Dembo, A., Ding, J., Gao, F.

2013; 49 (3): 873-884

- **Central limit theorem for biased random walk on multi-type Galton-Watson trees** *ELECTRONIC JOURNAL OF PROBABILITY*
  Dembo, A., Sun, N.
  2012; 17: 1-40
- **Markovian perturbation, response and fluctuation dissipation theorem** *ANNALES DE L INSTITUT HENRI POINCARE-PROBABILITES ET STATISTIQUES*
  Dembo, A., Deuschel, J.
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- **Gibbs measures and phase transitions on sparse random graphs** *BRAZILIAN JOURNAL OF PROBABILITY AND STATISTICS*
  Dembo, A., Montanani, A.
  2010; 24 (2): 137-211
- **ISING MODELS ON LOCALLY TREE-LIKE GRAPHS** *ANNALS OF APPLIED PROBABILITY*
  Dembo, A., Montanari, A.
  2010; 20 (2): 565-592
- **Spectral Measure of Heavy Tailed Band and Covariance Random Matrices** *COMMUNICATIONS IN MATHEMATICAL PHYSICS*
  Belinschi, S., Dembo, A., Guionnet, A.
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- **FINITE SIZE SCALING FOR THE CORE OF LARGE RANDOM HYPERGRAPHS** *ANNALS OF APPLIED PROBABILITY*
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  Dembo, A., Sznitman, A.
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- **Limiting dynamics for spherical models of spin glasses at high temperature** *JOURNAL OF STATISTICAL PHYSICS*
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- **How large a disc is covered by a random walk in n steps?** *ANNALS OF PROBABILITY*
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  Dembo, A., Guionnet, A., Mazza, C.
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- **Cugliandolo-Kurchan equations for dynamics of Spin-Glasses** *PROBABILITY THEORY AND RELATED FIELDS*
  Ben Arous, G., Dembo, A., Guionnet, A.
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- **On the disconnection of a discrete cylinder by a random walk** *PROBABILITY THEORY AND RELATED FIELDS*
  Dembo, A., Sznitman, A.
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- **Large and moderate diviations for Hotelling's T-2-statistic** *ELECTRONIC COMMUNICATIONS IN PROBABILITY*

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- **Late points for random walks in two dimensions** *ANNALS OF PROBABILITY*
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- **Spectral measure of large random Hankel, Markov and Toeplitz matrices** *ANNALS OF PROBABILITY*
  Bryc, W., Dembo, A., Jiang, T. F.
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- **Universal denoising for the finite-input general-output channel** *IEEE International Symposium on Information Theory*
  Dembo, A., Weissman, T.
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- **Lectures on probability theory and statistics** *33rd Probability Summer School*
  Dembo, A., Funaki, T.
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- **Large deviations of Markov chains indexed by random trees** *ANNALES DE L INSTITUT HENRI POINCARE-PROBABILITES ET STATISTIQUES*
  Dembo, A., Morters, P., Sheffield, S.
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- **Cover times for Brownian motion and random walks in two dimensions** *ANNALS OF MATHEMATICS*
  Dembo, A., Peres, Y., Rosen, J., Zeitouni, O.
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- **Large portfolio losses** *FINANCE AND STOCHASTICS*
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- **Universal denoising for the finite-input-general-output channel** *IEEE International Symposium on Information Theory*
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- **Large deviations for random walk in random environment with holding times** *ANNALS OF PROBABILITY*
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- **The minimax distortion redundancy in noisy source coding** *IEEE TRANSACTIONS ON INFORMATION THEORY*
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- **Large deviations for random walks on Galton-Watson trees: averaging and uncertainty** *PROBABILITY THEORY AND RELATED FIELDS*
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- **Thick points for intersections of planar sample paths** *TRANSACTIONS OF THE AMERICAN MATHEMATICAL SOCIETY*
  Dembo, A., Peres, Y., Rosen, J., Zeitouni, O.
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- **Aging of spherical spin glasses** *PROBABILITY THEORY AND RELATED FIELDS*
  Ben Arous, G., Dembo, A., Guionnet, A.
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- **Remarks on the maximum correlation coefficient** *BERNOULLI*
  Dembo, A., Kagan, A., SHEPP, L. A.
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  Dembo, A., Peres, Y., ROSEN, J., Zeitouni, O.
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  Dembo, A., Peres, Y., ROSEN, J., Zeitouni, O.
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  Dembo, A., Zajic, T.
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- **Tail estimates for one-dimensional random walk in random environment** *COMMUNICATIONS IN MATHEMATICAL PHYSICS*
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  Dembo, A., Zeitouni, O.
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  Dembo, A., Karlin, S., Zeitouni, O.
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- **ON THE PERCEPTRON LEARNING ALGORITHM ON DATA WITH HIGH-PRECISION** *JOURNAL OF COMPUTER AND SYSTEM SCIENCES*
  Siu, K. Y., Dembo, A., KAILATH, T.
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- **A TOPOLOGICAL CRITERION FOR HYPOTHESIS-TESTING** *ANNALS OF STATISTICS*

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- **A NOTE ON UNIFORM LAWS OF AVERAGES FOR DEPENDENT PROCESSES** *STATISTICS & PROBABILITY LETTERS*
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- **CENTRAL LIMIT-THEOREMS OF PARTIAL-SUMS FOR LARGE SEGMENTAL VALUES** *STOCHASTIC PROCESSES AND THEIR APPLICATIONS*
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  Karlin, S., Dembo, A.
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- **INFORMATION THEORETIC INEQUALITIES** *IEEE TRANSACTIONS ON INFORMATION THEORY*
  Dembo, A., COVER, T. M., Thomas, J. A.
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  Dembo, A., Karlin, S.
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- **STRONG LIMIT-THEOREMS OF EMPIRICAL FUNCTIONALS FOR LARGE EXCEEDANCES OF PARTIAL-SUMS OF IID VARIABLES** *ANNALS OF PROBABILITY*
  Dembo, A., Karlin, S.
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- **A GENERAL WEIGHT MATRIX FORMULATION USING OPTIMAL-CONTROL** *IEEE TRANSACTIONS ON NEURAL NETWORKS*
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  Dembo, A., Zeitouni, O.
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- **HIGH-ORDER ABSOLUTELY STABLE NEURAL NETWORKS** *IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS*
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