Stanford



Sourav Chatterjee

Professor of Statistics and of Mathematics

Curriculum Vitae available Online

Bio

ACADEMIC APPOINTMENTS

- Professor, Statistics
- Professor, Mathematics

ADMINISTRATIVE APPOINTMENTS

- Professor of Statistics and Mathematics, Stanford University, (2013- present)
- Visiting Associate Professor of Statistics and Mathematics, Stanford University, (2012-2013)
- Associate Professor of Mathematics, Courant Institute, New York University, (2009-2013)
- Associate Professor of Statistics and Mathematics, University of California, Berkeley, (2009-2011)
- Visiting Professor of Mathematics, Université de Toulouse, (2008-2008)
- Assistant Professor of Statistics, University of California, Berkeley, (2006-2009)
- Visiting Neyman Assistant Professor of Statistics, University of California, Berkeley, (2005-2006)

HONORS AND AWARDS

- Member of the American Academy of Arts and Sciences, American Academy of Arts and Sciences (2024)
- Fellow of the Royal Society, Royal Society of London (2023)
- Infosys Prize in Mathematical Sciences, Infosys Science Foundation (2020)
- Fellow of IMS, Institute of Mathematical Statistics (2018)
- ICM Invited Talk, International Congress of Mathematicians (2014)
- IISA Young Researcher Award, International Indian Statistical Association (2013)
- Line and Michel Loeve International Prize in Probability, University of Calfornia, Berkeley (2013)
- First recipient of the Doeblin Prize in Probability, Bernoulli Society with sponsorship from Springer-Verlag (2012)
- IMS Medallion Lecture, Institute of Mathematical Statistics (2012)
- Rollo Davidson Prize, Rollo Davidson Trustees, University of Cambridge (2010)
- Tweedie New Researcher Award, Institute of Mathematical Statistics (2008)
- Sloan Research Fellowship in Mathematics, Alfred P. Sloan Foundation (2007 - 2009)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Associate editor, Proceedings of the London Mathematical Society (2023 - present)
- Associate editor, Annals of Applied Probability (2022 - present)

- Associate editor, Communications in Mathematical Physics (2019 - present)
- Associate editor, Probability Theory and Related Fields (2012 - 2015)
- Editor, Sankhya, Series A (2012 - 2015)
- Associate editor, Annals of Probability (2009 - 2014)
- Associate editor, Annales de l'Institut Henri Poincare (B) (2008 - 2013)

PROFESSIONAL EDUCATION

- Bachelor, Indian Statistical Institute, Kolkata , Statistics (2000)
- Master, Indian Statistical Institute, Kolkata , Statistics (2002)
- Ph.D., Stanford University , Statistics (2005)

Teaching

COURSES

2026-27

- Fundamental Concepts of Analysis: MATH 171 (Spr)
- Linear Algebra and Matrix Theory: MATH 113 (Aut)
- Theory of Probability III: MATH 230C, STATS 310C (Spr)

2025-26

- Linear Algebra and Matrix Theory: MATH 113 (Spr)
- Methods from Statistical Physics: STATS 369 (Aut)
- Theory of Probability I: MATH 230A, STATS 310A (Aut)

2024-25

- Theory of Probability III: MATH 230C, STATS 310C (Spr)
- Topics in Mathematical Physics: MATH 273A (Aut)
- Topics in Mathematical Physics: MATH 273B (Win)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Zhiqi Li, Nathan Tung

Doctoral Dissertation Advisor (AC)

Fred Rajasekaran

Doctoral Dissertation Co-Advisor (AC)

Anna Lyubarskaja, Yanxin Zhou

Doctoral (Program)

Bruce Fang

Publications

PUBLICATIONS

- **A phase transition for the strength of weak ties.** *PNAS nexus*
  Chatterjee, E., Chatterjee, S.

2026; 5 (11): pgag364

- **A Vershik-Kerov theorem for wreath products** *GROUPS GEOMETRY AND DYNAMICS*
  Chatterjee, S., Diaconis, P.
  2026
- **A short proof of confinement in three-dimensional lattice gauge theories with a central U(1)** *ADVANCED NONLINEAR STUDIES*
  Chatterjee, S.
  2026
- **Rigorous results for timelike liouville field theory** *FORUM OF MATHEMATICS SIGMA*
  Chatterjee, S.
  2026; 14
- **NEURAL NETWORKS GENERALIZE ON LOW COMPLEXITY DATA** *ANNALS OF STATISTICS*
  Chatterjee, S., Sudijono, T.
  2026; 54 (1): 350-382
- **A SCALING LIMIT OF SU(2) LATTICE YANG-MILLS-HIGGS THEORY** *PROBABILITY AND MATHEMATICAL PHYSICS*
  Chatterjee, S.
  2026; 7 (2): 339-381
- **"Univariate-Guided Sparse Regression":Rejoinder** *HARVARD DATA SCIENCE REVIEW*
  Chatterjee, S., Hastie, T., Tibshirani, R.
  2025; 7 (3)
- **Univariate-Guided Sparse Regression.** *Harvard data science review*
  Chatterjee, S., Hastie, T., Tibshirani, R.
  2025; 7 (3)
- **SPECTRAL GAP OF NONREVERSIBLE MARKOV CHAINS** *ANNALS OF APPLIED PROBABILITY*
  Chatterjee, S.
  2025; 35 (4): 2644-2677
- **Liouville theory: an introduction to rigorous approaches** *JOURNAL OF HIGH ENERGY PHYSICS*
  Chatterjee, S., Witten, E.
  2025
- **AN INVARIANCE PRINCIPLE FOR THE 1D KPZ EQUATION** *ANNALS OF PROBABILITY*
  Adhikari, A., Chatterjee, S.
  2024; 52 (6): 2019-2050
- **Enumerative theory for the Tsetlin library** *JOURNAL OF ALGEBRA*
  Chatterjee, S., Diaconis, P., Kim, G. B.
  2024; 655: 139-162
- **Features of a Spin Glass in the Random Field Ising Model** *COMMUNICATIONS IN MATHEMATICAL PHYSICS*
  Chatterjee, S.
  2024; 405 (4)
- **A State Space for 3D Euclidean Yang-Mills Theories** *COMMUNICATIONS IN MATHEMATICAL PHYSICS*
  Cao, S., Chatterjee, S.
  2024; 405 (1)
- **Isomorphisms between random graphs** *JOURNAL OF COMBINATORIAL THEORY SERIES B*
  Chatterjee, S., Diaconis, P.
  2023; 160: 144-162
- **Weak convergence of directed polymers to deterministic KPZ at high temperature** *ANNALES DE L INSTITUT HENRI POINCARE-PROBABILITES ET STATISTIQUES*
  Chatterjee, S.

2023; 59 (2): 774-794

- **The Yang-Mills heat flow with random distributional initial data** *COMMUNICATIONS IN PARTIAL DIFFERENTIAL EQUATIONS*
  Cao, S., Chatterjee, S.
  2023
- **Matrix Completion With Data-Dependent Missingness Probabilities** *IEEE TRANSACTIONS ON INFORMATION THEORY*
  Bhattacharya, S., Chatterjee, S.
  2022; 68 (10): 6762-6773
- **Existence of stationary ballistic deposition on the infinite lattice** *RANDOM STRUCTURES & ALGORITHMS*
  Chatterjee, S.
  2022
- **Local KPZ Behavior Under Arbitrary Scaling Limits** *COMMUNICATIONS IN MATHEMATICAL PHYSICS*
  Chatterjee, S.
  2022
- **Superconcentration in surface growth** *RANDOM STRUCTURES & ALGORITHMS*
  Chatterjee, S.
  2022
- **Convergence of Deterministic Growth Models** *ARCHIVE FOR RATIONAL MECHANICS AND ANALYSIS*
  Chatterjee, S., Souganidis, P. E.
  2022
- **A PHASE TRANSITION FOR REPEATED AVERAGES** *ANNALS OF PROBABILITY*
  Chatterjee, S., Diaconis, P., Sly, A., Zhang, L.
  2022; 50 (1): 1-17
- **A SIMPLE MEASURE OF CONDITIONAL DEPENDENCE** *ANNALS OF STATISTICS*
  Azadkia, M., Chatterjee, S.
  2021; 49 (6): 3070-3102
- **Speeding up Markov chains with deterministic jumps (vol 178, pg 1193, 2020)** *PROBABILITY THEORY AND RELATED FIELDS*
  Chatterjee, S., Diaconis, P.
  2021
- **A Probabilistic Mechanism for Quark Confinement** *COMMUNICATIONS IN MATHEMATICAL PHYSICS*
  Chatterjee, S.
  2021
- **Average Gromov hyperbolicity and the Parisi ansatz** *ADVANCES IN MATHEMATICS*
  Chatterjee, S., Sloman, L.
  2021; 376
- **A Deterministic Theory of Low Rank Matrix Completion** *IEEE TRANSACTIONS ON INFORMATION THEORY*
  Chatterjee, S.
  2020; 66 (12): 8046–55
- **Fluctuation lower bounds in planar random growth models** *ANNALES DE L INSTITUT HENRI POINCARE-PROBABILITES ET STATISTIQUES*
  Bates, E., Chatterjee, S.
  2020; 56 (4): 2406–27
- **LOCALIZATION IN GAUSSIAN DISORDERED SYSTEMS AT LOW TEMPERATURE** *ANNALS OF PROBABILITY*
  Bates, E., Chatterjee, S.
  2020; 48 (6): 2755–2806
- **Speeding up Markov chains with deterministic jumps** *PROBABILITY THEORY AND RELATED FIELDS*
  Chatterjee, S., Diaconis, P.

2020

- **A New Coefficient of Correlation** *JOURNAL OF THE AMERICAN STATISTICAL ASSOCIATION*
  Chatterjee, S.
  2020
- **Wilson Loops in Ising Lattice Gauge Theory** *COMMUNICATIONS IN MATHEMATICAL PHYSICS*
  Chatterjee, S.
  2020
- **CONSTRUCTING A SOLUTION OF THE (2+1)-DIMENSIONAL KPZ EQUATION** *ANNALS OF PROBABILITY*
  Chatterjee, S., Dunlap, A.
  2020; 48 (2): 1014–55
- **LOCALIZATION IN RANDOM GEOMETRIC GRAPHS WITH TOO MANY EDGES** *ANNALS OF PROBABILITY*
  Chatterjee, S., Harel, M.
  2020; 48 (2): 574–621
- **THE ENDPOINT DISTRIBUTION OF DIRECTED POLYMERS** *ANNALS OF PROBABILITY*
  Bates, E., Chatterjee, S.
  2020; 48 (2): 817–71
- **Rigidity of the three-dimensional hierarchical Coulomb gas** *PROBABILITY THEORY AND RELATED FIELDS*
  Chatterjee, S.
  2019; 175 (3-4): 1123–76
- **Proof of the Path Localization Conjecture for Directed Polymers** *COMMUNICATIONS IN MATHEMATICAL PHYSICS*
  Chatterjee, S.
  2019; 370 (2): 703–17
- **A GENERAL METHOD FOR LOWER BOUNDS ON FLUCTUATIONS OF RANDOM VARIABLES** *ANNALS OF PROBABILITY*
  Chatterjee, S.
  2019; 47 (4): 2140–71
- **Central Limit Theorem for the Free Energy of the Random Field Ising Model** *JOURNAL OF STATISTICAL PHYSICS*
  Chatterjee, S.
  2019; 175 (1): 185–202
- **Rigorous Solution of Strongly Coupled SO(N) Lattice Gauge Theory in the Large N Limit** *COMMUNICATIONS IN MATHEMATICAL PHYSICS*
  Chatterjee, S.
  2019; 366 (1): 203–68
- **On the Decay of Correlations in the Random Field Ising Model** *COMMUNICATIONS IN MATHEMATICAL PHYSICS*
  Chatterjee, S.
  2018; 362 (1): 253–67
- **THE SAMPLE SIZE REQUIRED IN IMPORTANCE SAMPLING** *ANNALS OF APPLIED PROBABILITY*
  Chatterjee, S., Diaconis, P.
  2018; 28 (2): 1099–1135
- **Arbitrarily small perturbations of Dirichlet Laplacians are quantum unique ergodic** *JOURNAL OF SPECTRAL THEORY*
  Chatterjee, S., Galkowski, J.
  2018; 8 (3): 909–47
- **A CENTRAL LIMIT THEOREM FOR A NEW STATISTIC ON PERMUTATIONS** *INDIAN JOURNAL OF PURE & APPLIED MATHEMATICS*
  Chatterjee, S., Diaconis, P.
  2017; 48 (4): 561–73
- **Discussion of the Paper on Concentration for (Regularized) Empirical Risk Minimization by Sara van de Geer and Martin Wainwright** *SANKHYA-SERIES A-MATHEMATICAL STATISTICS AND PROBABILITY*
  Chatterjee, S.

2017; 79 (2): 208-211

- **MINIMAL SPANNING TREES AND STEIN'S METHOD** *ANNALS OF APPLIED PROBABILITY*
  Chatterjee, S., Sen, S.
  2017; 27 (3): 1588–1645
- **Large Deviations for Random Graphs: Ecole d'Ete de Probabilites de Saint-Flour XLV - 2015** *LARGE DEVIATIONS FOR RANDOM GRAPHS: ECOLE D'ETE DE PROBABILITES DE SAINT-FLOUR XLV - 2015*
  Chatterjee, S.
  2017; 2197: 1–167
- **The leading term of the Yang-Mills free energy** *JOURNAL OF FUNCTIONAL ANALYSIS*
  Chatterjee, S.
  2016; 271 (10): 2944-3005
- **AN INTRODUCTION TO LARGE DEVIATIONS FOR RANDOM GRAPHS** *BULLETIN OF THE AMERICAN MATHEMATICAL SOCIETY*
  Chatterjee, S.
  2016; 53 (4): 617-642
- **Nonlinear large deviations** *ADVANCES IN MATHEMATICS*
  Chatterjee, S., Dembo, A.
  2016; 299: 396-450
- **Absence of Replica Symmetry Breaking in the Random Field Ising Model** *COMMUNICATIONS IN MATHEMATICAL PHYSICS*
  Chatterjee, S.
  2015; 337 (1): 93-102
- **MATRIX ESTIMATION BY UNIVERSAL SINGULAR VALUE THRESHOLDING** *ANNALS OF STATISTICS*
  Chatterjee, S.
  2015; 43 (1): 177-214
- **A NEW PERSPECTIVE ON LEAST SQUARES UNDER CONVEX CONSTRAINT** *ANNALS OF STATISTICS*
  Chatterjee, S.
  2014; 42 (6): 2340-2381
- **Invariant Measures and the Soliton Resolution Conjecture** *COMMUNICATIONS ON PURE AND APPLIED MATHEMATICS*
  Chatterjee, S.
  2014; 67 (11): 1737-1842
- **Fluctuations of the Bose-Einstein condensate** *JOURNAL OF PHYSICS A-MATHEMATICAL AND THEORETICAL*
  Chatterjee, S., Diaconis, P.
  2014; 47 (8)
- **Superconcentration and Related Topics**
  Chatterjee, S.
  Springer, Berlin-Heidelberg.2014
- **A short survey of Stein's method**
  Chatterjee, S.
  edited by Jang, S. Y., Kim, Y. R., Lee, D. W., Yie
  Kyung Moon SA Co Ltd.2014: 1-24
- **ESTIMATING AND UNDERSTANDING EXPONENTIAL RANDOM GRAPH MODELS** *ANNALS OF STATISTICS*
  Chatterjee, S., Diaconis, P.
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- **Central limit theorem for first-passage percolation time across thin cylinders** *PROBABILITY THEORY AND RELATED FIELDS*
  Chatterjee, S., Dey, P. S.
  2013; 156 (3-4): 613-663

- **Random overlap structures: properties and applications to spin glasses** *PROBABILITY THEORY AND RELATED FIELDS*
  Arguin, L., Chatterjee, S.
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- **The universal relation between scaling exponents in first-passage percolation** *ANNALS OF MATHEMATICS*
  Chatterjee, S.
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- **The missing log in large deviations for triangle counts** *RANDOM STRUCTURES & ALGORITHMS*
  Chatterjee, S.
  2012; 40 (4): 437-451
- **Probabilistic methods for discrete nonlinear Schrodinger equations** *COMMUNICATIONS ON PURE AND APPLIED MATHEMATICS*
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- **A new approach to strong embeddings** *PROBABILITY THEORY AND RELATED FIELDS*
  Chatterjee, S.
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- **Random Multiplicative Functions in Short Intervals** *INTERNATIONAL MATHEMATICS RESEARCH NOTICES*
  Chatterjee, S., Soundararajan, K.
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- **Large deviations for random matrices** *Communications on Stochastic Analysis*
  Chartejee, S., Varadhan, S. R.
  2012; 6 (1): 1-13
- **A Combinatorial Analysis of Interacting Diffusions** *JOURNAL OF THEORETICAL PROBABILITY*
  Chatterjee, S., Pal, S.
  2011; 24 (4): 939-968
- **The large deviation principle for the Erdos-Renyi random graph** *EUROPEAN JOURNAL OF COMBINATORICS*
  Chatterjee, S., Varadhan, S. R.
  2011; 32 (7): 1000-1017
- **RANDOM GRAPHS WITH A GIVEN DEGREE SEQUENCE** *ANNALS OF APPLIED PROBABILITY*
  Chatterjee, S., Diaconis, P., Sly, A.
  2011; 21 (4): 1400-1435
- **NONNORMAL APPROXIMATION BY STEIN'S METHOD OF EXCHANGEABLE PAIRS WITH APPLICATION TO THE CURIE-WEISS MODEL** *ANNALS OF APPLIED PROBABILITY*
  Chatterjee, S., Shao, Q.
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- **Spectral clustering and the high-dimensional Stochastic Block Model** *Annals of Statistics*
  Chartterjee, S., Rohe, K., Yu, B.
  2011; 39 (4): 1878-1915
- **Exponential Approximation by Stein's Method and Spectral Graph Theory** *ALEA-LATIN AMERICAN JOURNAL OF PROBABILITY AND MATHEMATICAL STATISTICS*
  Chatterjee, S., Fulman, J., Roellin, A.
  2011; 8: 197-223
- **APPLICATIONS OF STEIN'S METHOD FOR CONCENTRATION INEQUALITIES** *ANNALS OF PROBABILITY*
  Chatterjee, S., Dey, P. S.
  2010; 38 (6): 2443-2485
- **Spin glasses and Stein's method** *PROBABILITY THEORY AND RELATED FIELDS*
  Chatterjee, S.

2010; 148 (3-4): 567-600

- **PHASE TRANSITIONS IN GRAVITATIONAL ALLOCATION** *GEOMETRIC AND FUNCTIONAL ANALYSIS*
  Chatterjee, S., Peled, R., Peres, Y., Romik, D.
  2010; 20 (4): 870-917
- **Gravitational allocation to Poisson points** *ANNALS OF MATHEMATICS*
  Chatterjee, S., Peled, R., Peres, Y., Romik, D.
  2010; 172 (1): 617-671
- **A phase transition behavior for Brownian motions interacting through their ranks** *PROBABILITY THEORY AND RELATED FIELDS*
  Chatterjee, S., Pal, S.
  2010; 147 (1-2): 123-159
- **AN OBSERVATION ABOUT SUBMATRICES** *ELECTRONIC COMMUNICATIONS IN PROBABILITY*
  Chatterjee, S., Ledoux, M.
  2009; 14: 495-500
- **Central Limit Theorems for the Energy Density in the Sherrington-Kirkpatrick Model** *JOURNAL OF STATISTICAL PHYSICS*
  Chatterjee, S., Crawford, N.
  2009; 137 (4): 639-666
- **CONSISTENT ESTIMATES OF DEFORMED ISOTROPIC GAUSSIAN RANDOM FIELDS ON THE PLANE** *ANNALS OF STATISTICS*
  Anderes, E., Chatterjee, S.
  2009; 37 (5A): 2324-2350
- **Fluctuations of eigenvalues and second order Poincare inequalities** *PROBABILITY THEORY AND RELATED FIELDS*
  Chatterjee, S.
  2009; 143 (1-2): 1-40
- **A new method of normal approximation** *ANNALS OF PROBABILITY*
  Chatterjee, S.
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- **Multivariate normal approximation using exchangeable pairs** *ALEA-LATIN AMERICAN JOURNAL OF PROBABILITY AND MATHEMATICAL STATISTICS*
  Chatterjee, S., Meckes, E.
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- **Estimation in spin glasses: A first step** *ANNALS OF STATISTICS*
  Chatterjee, S.
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- **Stein's method for concentration inequalities** *PROBABILITY THEORY AND RELATED FIELDS*
  Chatterjee, S.
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- **Concentration of Haar measures, with an application to random matrices** *JOURNAL OF FUNCTIONAL ANALYSIS*
  Chatterjee, S.
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- **A generalization of the Lindeberg principle** *ANNALS OF PROBABILITY*
  Chatterjee, S.
  2006; 34 (6): 2061-2076
- **Exchangeable pairs and Poisson approximation** *Probability Surveys*
  Chartterjee, S., Diaconis, P., Meckes, E.
  2005; 2: 64-106
- **Exchangeable pairs and Poisson approximation** *PROBABILITY SURVEYS*
  Chatterjee, S., Diaconis, P., Meckes, E.

2005; 2: 64-106

- **Concentration inequalities with exchangeable pairs** *Ph.D. thesis. Stanford University*
  Chartterjee, S.
  2005
- **A new method for bounding rates of convergence of empirical spectral distributions** *JOURNAL OF THEORETICAL PROBABILITY*
  Chatterjee, S., Bose, A.
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- **Limiting spectral distributions of large dimensional random matrices** *Journal of the Indian Statistical Association*
  Chartterjee, S., Bose, A., Gangyopadhyay, S.
  2003; 41 (2): 221-259