Curriculum Vitae

Hong-Bin Chen

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Employment

09/2025–	Assistant Professor, New York University Shanghai, China
09/2022–08/2025	Postdoc, Institut des Hautes Études Scientifiques, France

Education

09/2017–05/2022	Ph.D., Mathematics, New York University, USA
09/2013–05/2017	B.S., Honors Mathematics, New York University Shanghai, China

Research Interest

Probability theory and probabilistic models from statistical physics

Papers

1. Hong-Bin Chen, Victor Issa, and Jean-Christophe Mourrat. The convex structure of the parisi formula for multi-species spin glasses. *arXiv preprint arXiv:2508.06397*, 2025
2. Hong-Bin Chen and Victor Issa. Uniqueness of Parisi measures for enriched convex vector spin glass. *arXiv preprint arXiv:2504.15818*, 2025
3. Hong-Bin Chen and Victor Issa. Differentiability and overlap concentration in optimal Bayesian inference. *arXiv preprint arXiv:2501.08786*, 2025
4. Hong-Bin Chen. Envelope presentation of Hamilton–Jacobi equations from spin glasses. *arXiv preprint arXiv:2412.20610*, 2024 (accepted by Comm. Partial Differential Equations)
5. Hong-Bin Chen. Color symmetry and ferromagnetism in Potts spin glass. *Journal of Statistical Physics*, 192(8):115, 2025
6. Hong-Bin Chen and Jean-Christophe Mourrat. Simultaneous replica-symmetry breaking for vector spin glasses. *arXiv preprint arXiv:2411.14105*, 2024
7. Hong-Bin Chen. On free energy of non-convex multi-species spin glasses. *arXiv preprint arXiv:2411.13342*, 2024
8. Hong-Bin Chen. Free energy in spin glass models with conventional order. *Journal of Statistical Physics*, 191(4):49, 2024
9. Hong-Bin Chen. On Parisi measures of Potts spin glasses with correction. *Electronic Communications in Probability*, 29:1–13, 2024

10. Hong-Bin Chen. Parisi PDE and convexity for vector spins. *Stochastic Processes and their Applications*, page 104746, 2025

11. Hong-Bin Chen. On the self-overlap in vector spin glasses. *Journal of Mathematical Physics*, 65(3), 2024

12. Hong-Bin Chen and Jean-Christophe Mourrat. On the free energy of vector spin glasses with nonconvex interactions. *Probability and Mathematical Physics*, 6(1):1–80, 2025

13. Hong-Bin Chen and Jiaming Xia. Conformal invariance of random currents: a stability result. *arXiv preprint arXiv:2306.10625*, 2023

14. Hong-Bin Chen. Self-overlap correction simplifies the Parisi formula for vector spins. *Electronic Journal of Probability*, 28(none):1 – 20, 2023

15. Hong-Bin Chen. A PDE perspective on the Aizenman-Sims-Starr scheme. *arXiv preprint arXiv:2212.09542*, 2022

16. Hong-Bin Chen and Jiaming Xia. Hamilton–Jacobi equations with monotone nonlinearities on convex cones. *arXiv preprint arXiv:2206.12537*, 2022 (accepted by Ann. Fac. Sci. Toulouse)

17. Yuri Bakhtin, Hong-Bin Chen, and Zsolt Pajor-Gyulai. Rare transitions in noisy heteroclinic networks. *arXiv preprint arXiv:2205.00326*, 2022 (accepted by Mem. Am. Math. Soc.)

18. Hong-Bin Chen and Jiaming Xia. Hamilton–Jacobi equations from mean-field spin glasses. *Probability Theory and Related Fields*, pages 1–71, 2025

19. Hong-Bin Chen and Jiaming Xia. Free energy of multi-layer generalized linear models. *Communications in Mathematical Physics*, pages 1–53, 2023

20. Hongbin Chen, Jean-Christophe Mourrat, and Jiaming Xia. Statistical inference of finite-rank tensors. *Annales Henri Lebesgue*, 5:1161–1189, 2022

21. Hong-Bin Chen, Sinho Chewi, and Jonathan Niles-Weed. Dimension-free log-Sobolev inequalities for mixture distributions. *Journal of Functional Analysis*, 281(11):109236, 2021

22. Yuri Bakhtin and Hong-Bin Chen. Dynamic polymers: invariant measures and ordering by noise. *Probability Theory and Related Fields*, 2021

23. Hong-Bin Chen and Jiaming Xia. Fenchel–moreau identities on convex cones. *Annales de la Faculté des sciences de Toulouse : Mathématiques*, Ser. 6, 33(2):287–309, 2024

24. Hong-Bin Chen and Jiaming Xia. Hamilton–Jacobi equations for inference of matrix tensor products. *Annales de l'Institut Henri Poincare (B) Probabilites et statistiques*, 58(2):755–793, 2022

25. Hong-Bin Chen. Hamilton–Jacobi equations for nonsymmetric matrix inference. *The Annals of Applied Probability*, 32(4):2540–2567, 2022

26. Hong-Bin Chen and Jonathan Niles-Weed. Asymptotics of smoothed Wasserstein distances. *Potential Analysis*, pages 1–25, 2021

27. Yuri Bakhtin and Hong-Bin Chen. Atypical exit events near a repelling equilibrium. *The Annals of Probability*, 49(3):1257–1285, 2021

28. Yuri Bakhtin and Hong-Bin Chen. Long exit times near a repelling equilibrium. *The Annals of Applied Probability*, 31(2):594–624, 2021

Services

Referee for *Annales Henri Poincaré*, *Communications in Mathematical Physics*, *Electronic Journal of Probability*, *Journal of Statistical Physics*

Reviewer for *Mathematical Reviews*

Talks

Jul 23, 2025 — *The Convex Structure of the Parisi Formula for Multi-species Spin Glasses* (short talk), 2025 Progress in Discrete and Continuous Probability, Schenectady, NY

Jun 26, 2025 — *The Convex Structure of the Parisi Formula for Multi-species Spin Glasses* (short talk), 2025 IHES Summer School - Statistical Aspects of Nonlinear Physics

Jun 3, 2025 — *On free energy in non-convex mean-field spin glass models*, Séminaire de Probabilités, Institut de Mathématiques de Toulouse

Feb 24, 2025 — *On free energy in non-convex mean-field spin glass models*, 2025 Workshop on Mathematical Physics, Les Diablerets, Switzerland

Jan 10, 2025 — *On free energy in non-convex mean-field spin glass models*, Probability and Statistical Physics 2025, TSIMF, Sanya, China

Nov 29, 2024 — *On free energy in non-convex mean-field spin glass models*, Probability and Analysis Informal Seminar, IHES

Nov 9, 2024 — *On free energy in non-convex mean-field spin glass models*, KU Probability and Statistics Conference 2024, University of Kansas

Oct 16, 2024 — *Free energy in non-convex mean-field spin glass models*, 2024 Greater Paris Area Mathematics Postdocs Day, Institut Henri Poincaré

Sep 30, 2024 — *Parisi PDE and its probabilistic representations*, Séminaire de Probabilités, IRMAR, Université de Rennes

Sep 27, 2024 — *Free energy in non-convex mean-field spin glass models*, Rencontres de Probabilités 2024, LMRS, Université de Rouen Normandie

May 30, 2024 — *Rare transitions in heteroclinic networks*, Ten Years of Mathematics at NYU Shanghai

May 21, 2024 — *Free energy in non-convex mean-field spin glass models*, Probability Seminar, Yau Mathematical Sciences Center, Tsinghua University

May 17, 2024 — *Dynamic polymers: invariant measures and ordering by noise*, Spring School on Critical Singular SPDEs, Peking University

Jun 16, 2023 — *On spin-glass free energy representations* (short talk), High Dimensional Statistics and Random Matrices – A mathematics conference on the island of Porquerolles

May 23, 2023	*Self-overlap correction simplifies the Parisi formula for vector spins*, Oberseminar Analysis & Zufall, Technical University of Munich
Dec 5, 2022	*Random perturbation of dynamics* (short talk), Probability and Analysis Informal Seminar, IHES
Feb 21, 2022	*Atypical exit near a repelling equilibrium*, Working Group Seminar on Stochastic Processes and Related Topics (online), Imperial College London
Nov 3, 2021	*Rare exit events near a repelling equilibrium*, Probability Seminar, University of Maryland
Sep 27, 2021	*A brief introduction to Malliavin calculus*, Student Probability Seminar, Courant Institute, NYU
Mar 10, 2021	*Dynamic polymers: invariant measures and ordering by noise*, Probability Seminar (online), Purdue University
Feb 24, 2021	*Asymptotics of Wasserstein distances under Gaussian smoothing*, Student Probability Seminar (online), Courant Institute, NYU
Feb 12, 2021	*Dynamic polymers: invariant measures and ordering by noise* (short talk), 14th Oxford-Berlin Young Researchers Meeting on Applied Stochastic Analysis (online)
Feb 4, 2021	*Dynamic polymers: invariant measures and ordering by noise*, Probability Seminar (online), University of Wisconsin-Madison
Nov 30, 2020	*Asymptotics of Smoothed Wasserstein Distances*, Probability Seminar, NYU Shanghai
Oct 29, 2020	*Atypical exit events near a repelling equilibrium*, Webinar, Tsinghua University
Oct 12, 2020	*Hamilton–Jacobi equations for statistical inference problems*, Probability Seminar, Peking University
Aug 26, 2020	*Atypical exit events near a repelling equilibrium* (short talk), Bernoulli-IMS One World Symposium 2020 (online)
Jun 10, 2020	*Atypical exit events near a repelling equilibrium* (short talk), 13th Annual ERC Berlin-Oxford Young Researchers Meeting on Applied Stochastic Analysis (online)
Nov 22, 2019	*Rare exit events near a repelling equilibrium* (short talk), 18th Northeast Probability Seminar, CUNY
Oct 31, 2019	*Rare exit events near a repelling equilibrium*, Math Special Alumni Seminar, NYU Shanghai
Oct 24, 2019	*Rare exit events near a repelling equilibrium*, Student Probability Seminar, Courant Institute, NYU
May 6, 2019	*Laplace's method and exit problems*, Student Probability Seminar, Courant Institute, NYU

Teaching

2021 Summer	Math Finance Summer Bootcamp 2021 - Recitations, New York University

2021 Spring	MATH-SHU 140 Linear Algebra - Recitation (two sessions), New York University Shanghai
2020 Fall	MATH-UA 140 Linear Algebra - Recitation[†], New York University MATH-UA 211 Math for Econ - Recitation[†], New York University
2020 Spring	MATH-UA 325 Analysis – Recitation (two sessions), New York University
2019 Fall	MATH-UA 325 Analysis – Recitation, New York University

Honors and Awards

2020	Harold Grad Memorial Prize, Courant Institute
2017	Phi Beta Kappa, NYU Chapter
2017	Graduated *summa cum laude*, NYU Shanghai
2014 – 2016	Dean's List, NYU Shanghai
2014 – 2015	NYU Shanghai Recognition Award
2014	President's Service Award, New York University
2014	Shanghai Scholarship
2013	Freshman Merit Scholarship, NYU Shanghai

[†]For the NYU "Go Local" program where NYU students attend lectures by instructors in New York via Zoom, and recitations in Shanghai in-person.