Hao Shen
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Academic Positions

2023.8 - Now	Associate Professor, University of Wisconsin - Madison
2018.8 - 2023.7	Assistant Professor, University of Wisconsin - Madison
2015.8 - 2018.7	Ritt Assistant Professor and Minerva Fellow, Columbia University, Mentor: Ivan Corwin
2014.8 - 2015.7	Research Associate, University of Warwick, Mentor: Martin Hairer
2013.8 - 2014.7	Research Associate, Princeton University, Mentor: Weinan E

Education

- May 2013 PhD. Princeton University.
- June 2008 BSc. and MSc. Peking University.

Research Interests

Stochastic PDE, probability, stochastic analysis, mathematical physics, quantum field theory, gauge theories, statistical mechanics, interacting particle systems.

Publications and Preprints

1. H. Shen, R. Zhu and X. Zhu, Large N limit and $1/N$ expansion of invariant observables in $O(N)$ linear σ-model via SPDE. *arXiv:2306.05166*.
2. I. Chevyrev and H. Shen, Invariant measure and universality of the 2D Yang–Mills Langevin dynamic. *arXiv:2302.12160* (157 pages).
3. H. Shen, R. Zhu and X. Zhu, A stochastic analysis approach to lattice Yang-Mills at strong coupling. *Comm. Math. Phys.* 400, 805-851 (2023).
4. A stochastic PDE approach to large N problems in quantum field theory: a survey. *J. Math. Phys.* (2022), 63(8): 081103.
5. H. Shen, S. Smith and R. Zhu, A new derivation of the finite N master loop equation for lattice Yang-Mills, *arXiv:2202.00880*, submitted.
6. A. Chandra, I. Chevyrev, M. Hairer and H. Shen, Stochastic quantisation of Yang–Mills–Higgs in 3D, *arXiv:2201.03487* (151 pages).
7. H. Shen, R. Zhu and X. Zhu, An SPDE approach to perturbation theory of Φ^4_2: asymptoticity and short distance behavior, *Ann. App. Probab.* 33(4) (2023): 2600-2642.
8. H. Shen, R. Zhu and X. Zhu, Large N limit of the $O(N)$ linear sigma model in 3D, *Comm. Math. Phys.* **394**, 953-1009 (2022)
9. A. Chandra, I. Chevyrev, M. Hairer and H. Shen, Langevin dynamic for the 2D Yang-Mills measure, *Publ. Math. IHÉS.* (2022), 1-147.
10. H. Shen, S. Smith, R. Zhu and X. Zhu, Large N limit of the linear sigma model via stochastic quantization, *Ann. Probab.* (2022), 50(1): 131-202.
11. H. Shen, J. Song, R. Sun and L. Xu, Scaling limit of a directed polymer among a Poisson field of independent walks, *J. Funct. Anal.* (2021), 281(5): 109066.
12. Julien Dubédat and H. Shen, Stochastic Ricci flow on compact surfaces, *Int. Math. Res. Not.* (2022), 63(8): 081103.
13. I. Corwin and H. Shen, Some recent progress in singular stochastic partial differential equations, *Bulletin of the American Mathematical Society* 57.3 (2020): 409-454.

14. A. Chandra, D. Erhard and H. Shen, Local solution to the multi-layer KPZ equation, *J. Stat. Phys.* **175** *(2019), no. 6, 1080-1106.*
15. A. Chandra, M. Hairer and H. Shen, The dynamical sine-Gordon model in the full subcritical regime, arXiv:1808.02594.
16. H. Shen and L.-C. Tsai, Stochastic Telegraph equation limit for the stochastic six vertex model, *Proc. Amer. Math. Soc.* 147 (2019), 2685-2705
17. I. Corwin, P. Ghosal, H. Shen and L.-C. Tsai, Stochastic PDE limit of the six vertex model, *Comm. Math. Phys.* (2020): 1-94.
18. H. Shen, Stochastic quantization of an Abelian gauge theory, *Comm. Math. Phys.* (2021) 384(3), 1445-1512
19. I. Corwin and H. Shen, Open ASEP in the weakly asymmetric regime, *Comm. Pure Appl. Math.* 71, no. 10 (2018): 2065-2128.
20. H. Shen and H. Weber, Glauber dynamics of 2D Kac-Blume-Capel model and their stochastic PDE limits, *J. Funct. Anal. Vol 275, Issue 6, (2018), 1321-1367*
21. A. Chandra and H. Shen, Moment bounds for SPDEs with non-Gaussian fields and application to the Wong-Zakai problem, *Electron. J. Probab. Vol 22 (2017), paper no. 68.*
22. I. Corwin, H. Shen and L-C. Tsai, ASEP(q,j) converges to the KPZ equation, *Ann. Inst. Henri Poincaré (B) Probab. Stat. (2018),* **54***, No. 2, 995-1012.*
23. H. Shen and W. Xu, Weak universality of dynamical Φ^4_3: non-Gaussian noise, *Stoch PDE: Anal Comp (2017).*
24. M. Hairer and H. Shen, A central limit theorem for the KPZ equation, *Ann. Probab.* **45** *(2017), no. 6B, 4167-4221.*
25. M. Hairer and H. Shen, The dynamical sine-Gordon model, *Comm. Math. Phys.* **341** *(2016), no. 3, 933-989*
26. I. Corwin, T. Seppäläinen and H. Shen, The strict-weak lattice polymer, *J. Stat. Phys.* **160** *(2015), no. 4, 1027-1053*
27. W. E and H. Shen, Exact renormalization group analysis of turbulent transport by the shear flow, *J. Stat. Phys.* **153** *(2013), no. 4, 553-571*
28. W. E and H. Shen, Mean field limit of a dynamical model of polymer systems, *Sci. China Math.* **56** *(2013), no. 12, 2591-2598*
29. H. Shen, A renormalization group method by harmonic extensions and the classical dipole gas, *Ann. Henri Poincaré* **17** *(2016), no. 4, 861-911*
30. W. E, A. Jentzen and H. Shen, Renormalized powers of Ornstein-Uhlenbeck processes and well-posedness of stochastic Ginzburg-Landau equations, *Nonlinear Anal.* **142** *(2016), 152-193*

Grants, Awards, Honors

- Simons Fellow in Mathematics (2024);
- NSF CAREER, DMS-2044415 (2021-2026);
- NSF DMS-1954091 (2020-2023);
- UW-Madison Fall competition award (2019; withdrawn upon receiving NSF)
- "Editors' pick from the Annals of Probability", 2018 IMS Annual Meeting at Vilnius;
- NSF DMS-1804339 (Conference Grant, Co-PI, 2018-2019);
- NSF DMS-1712684 (2017-2020, changed to DMS-1909525 when PI moved to Madison);
- Axioms Travel Awards (2017);
- AMS Simons Travel Grant (2016 - 2018);

- Columbia University Minerva Foundation Fellowship (2015 - 2019);
- Princeton University Centennial Fellowship (2008 - 2012).

Editorial services

- Annals of Probability: Associate Editor

Lecture Notes, Workshop Reports

1. H. Shen, Lecture notes for course "Topics in Stochastic PDE" taught at Columbia University and University of Wisconsin-Madison (in progress)
2. H. Shen, *SPDEs with three types of multiplicative noises*, Oberwolfach workshop report "Rough Paths, Regularity Structures and Related Topics" (2016), no. 24, 65-66.
3. H. Shen, *A dynamical approach to lattice Yang–Mills*, Oberwolfach workshop report "Universality: Random Matrices, Random Geometry and SPDEs" (2022),

Theses

- *PhD Thesis: Renormalization Theory in Statistical Physics and Stochastic Analysis*

  Committee: Michael Aizenman & Weinan E (Supervisor) & Thomas Spencer

  Description: This thesis consists of: (1) a rigorous renormalization group method based on harmonic extensions; (2) well-posedness of a class of stochastic Ginzburg-Landau equations; (3) rigorous renormalization group study of turbulent transport by the shear flow.

Teaching Experience (including upcoming courses)

Wisconsin - Madison:

Spring	2024	An Introduction to Brownian Motion and Stochastic Calculus (Math 635)
Fall	2023	Theory of Probability I (Math 733),
Spring	2023	**Topics on SPDE** (Math 833),
Fall	2022	Stochastic Analysis (Math 735),
Spring	2022	An Introduction to Brownian Motion and Stochastic Calculus (Math 635)
Fall	2021	Calculus and Analytic Geometry II (Math 222, two sections)
Spring	2021	Introduction to the Theory of Probability (Math 431),
Fall	2020	Stochastic Analysis (Math 735),
Spring	2020	**Topics on SPDE** (Math 833),
Spring	2020	An Introduction to Brownian Motion and Stochastic Calculus (Math 635),
Spring	2019	Introduction to the Theory of Probability (Math 431),
Fall	2018	Stochastic Analysis (Math 735),

Math 990 Reading and Research (Independent Study) Fall 2019-2020, Fall 2020-2021
Math 699 Directed Study (Independent Study) Summer 2020

Columbia University:

Spring	2018	Calculus IV (Two sections),
Fall	2017	Calculus IV,
Spring	2017	**Topics in Stochastic PDE**,
Fall	2016	Calculus IV (Two sections),
Summer	2016	Ordinary Differential Equations (temporary instructor),
Spring	2016	Calculus IV,
Fall	2015	Calculus I (Two sections),

Summer school lectures and mini-courses

- 2016: 7/25-8/05, Peking Univ., 2-week summer course on stochastic PDEs and regularity structures
- 2018: 7/30-8/03, Chinese Academy of Sciences, Mini-lectures on Stochastic PDE in "The International Program on Regularity Structures and Stochastic Systems"
- 2020 Aug, Chinese Academy of Sciences - Beijing Institute of Technology joint SPDE summer school, One-week summer course *"Quantum field theory and stochastic PDE"*
- 2024: 7/1-7/12, MSRI/SLMath Summer Graduate School Lectures: *"Stochastic Quantisation"*.
- 2024: 7/22-7/28, mini-course at Bernoulli Center program "New developments and challenges in Stochastic Partial Differential Equations", EPFL, Lausanne, Switzerland.
- 2024: 7/22-8/2, Cornell Summer school

Other mini-lectures

- 2018: 7/16-7/20, Chinese Academy of Sciences, Supplementary lectures for Martin Hairer's course on the theory of regularity structures.
- 2020 Dec, Shandong University, Online lectures on *"Quantum field theory and stochastic PDE"*
- 2022: 6/21-6/23, Imperial College, 3 lectures on *"A dynamical approach to lattice Yang–Mills"*

Short-term visiting activities

1. Trimester Program "Randomness, PDEs and Nonlinear Fluctuations", Hausdorff Research Institute for Mathematics, Bonn, Germany. September-December 2019
2. Trimester Program "Probabilistic methods in quantum field theory", Hausdorff Research Institute for Mathematics, Bonn, Germany. May-August 2025

Conference and Workshop Talks

1. BIRS Workshop "Stochastics and Geometry", Banff, Canada. 9/8-9/13/2024
2. BIRS-IASM workshop "Partial Differential Equations: Deterministic and Probabilistic", Hangzhou, China. 8/18-8/23/2024
3. "Stochastic PDEs in Seoul 2024", KIAS, South Korea. 8/12-8/16/2024
4. "Quantum Fields and Probability II", Institut Mittag-Leffler, Djursholm, Sweden. 7/15-7/19/2024.
5. Pacific Rim Conference in Mathematics, Darwin, Australia. 6/17-6/21/2024
6. Oberwolfach Workshop "Statistical Physics and Random Surfaces", Germany. 5/12-5/17/2024
7. Conference "Frontiers of Stochastic Analysis", Chicago. *Tutorial talk (2 lectures).* 8/9–8/11/2023
8. PKU Mathematics Forum, Beijing. 8/2–8/5/2023
9. "Stochastic analysis meets QFT - critical theory", Muenster, Germany.
   Title: Invariant measure and universality of the 2D Yang-Mills Langevin dynamic (I). 6/12–6/14/2023

10. 13th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Session "Stochastic modeling in biological, physical and social sciences: theory and applications",
    Title: "Lattice Yang–Mills and SPDE limit in 2D". North Carolina Wilmington. 5/31-6/4/2023
11. BIRS Workshop "Random Growth Models and KPZ Universality", Banff, Canada.
    Title: "Universality of 2D Yang–Mills". 5/28-6/2/2023
12. BIRS Conference "New Trends in Stochastic Analysis", Casa Matematica, Oaxaca, Mexico.
    Title: "Universality of 2D Yang–Mills". 5/21-5/26/2023
13. Stochastic PDEs and Related Topics, Brin Center, Maryland,
    Title: Stochastic Yang-Mills process in 2D and 3D. 11/14-11/16/2022
14. Oberwolfach Workshop "Universality: Random Matrices, Random Geometry and SPDEs", Germany, Title: A dynamical approach to lattice Yang–Mills 5/29-6/4/2022
15. Random Matrix EurAsia, Singapore, Title: Lattice Yang–Mills and a dynamical approach 4/18-5/13/2022
16. International Conference for Chinese Young Probability Scholars, Xiangtan
    Title: "Stochastic quantization of Yang-Mills in 3D" 10/2021
17. 10^{th} International Conference on Stochastic Analysis and its Applications (ICSAA), Kyoto,
    Title: "Stochastic Yang-Mills process in 3D" 9.6–9.10/2021
18. Bath Mathematical Symposium on "PDE and Randomness", UK
    Title: "Large N via stochastic quantization" 9.1–9.10/2021
19. 20^{th} International Congress on Mathematical Physics (ICMP), Geneva, session "Nonequilibrium Statistical Mechanics", Title: "Large N limit of stochastic PDEs" 8.2-8.7/2021
20. 10^{th} World Congress in Probability and Statistics, Seoul, Session "Stochastic Partial Differential Equations" organized by L.Mytnik, Title: "Stochastic quantization, Large N, and mean field limit" 7.19-23/2021
21. Webinar on Analysis and PDEs (4), organized by Yu Deng,
    Title: "Stochastic quantization of Yang-Mills" 4/30/2021
22. AIM Workshop "Criticality and stochasticity in quasilinear fluid systems", San Jose,
    Title: "Stochastic quantization of Yang-Mills" 4/5-4/9/2021
23. 2020: 11/5-11/6, Two mini-lectures on *"Stochastic Quantization"* for "Quantization Days" organized by E.Peltola and Y.Wang
24. Online talk for Integrable Probability FRG meeting
    Title: "SPDE limit of a directed polymer in Poisson random walks" 4/3/2020
25. Symposium on Probability and Statistics, Chinese Academy of Sciences,
    Title: "Stochastic quantization of gauge theories" 12/15/2019
26. Workshop "SPDE day – recent progress on quasilinear equations", Hausdorff Institute, Bonn,
    Titile: "Stochastic Ricci flow on surfaces". 10/18/2019
27. AMS Sectional Meeting, Session "Stochastic Partial Differential Equations and Related Fields", Madison, organized by Igor Cialenco, Yu Gu, and Hyun-Jung Kim,
    Title: Stochastic quantization of gauge theories. 9/15/2019
28. IMS-China 2019, Dalian, Invited session "KPZ equations and related models",
    Title: "Local solution to the multilayer KPZ equation"; 7/9/2019
29. IMS-China 2019, Dalian, Invited session "Rough path and SPDE" organized by Weijun Xu,
    Title: Stochastic quantization of gauge theories; 7/8/2019
30. Conference "Paths between Probability, PDEs, and Physics", Imperial College London, organized by Chandra, Hairer, Xu, Title: Stochastic Ricci flow on compact surfaces, 7/5/2019
31. Conference "Probability and quantum field theory: discrete models, CFT, SLE and constructive aspects", Porquerolles (France), June 10th - 21st, organized by C.Garban, R.Rhodes, V.Vargas.
    Title: Stochastic Ricci Flow on Compact Surfaces 6/13/2019

32. AMS Sectional Meeting, Special session "Advances in Mathematical Fluid Mechanics", University of Hawaii, Title: Stochastic Burgers equation from six vertex model; 3/23/2019
33. Workshop "Scaling limits & SPDEs: recent developments and future directions", Isaac Newton Institute, Cambridge, Title: SPDE limits of six vertex model. 12/13/2018
34. AMS Sectional Meeting "Special Session on Probability, Combinatorics, and Statistical Mechanics", University of Delaware, Title: Stochastic quantization of gauge theories. 9/29/2018
35. Workshop on Statistical Physics and Probability, Beijing International Center for Mathematical Research, Title: Scaling limit results in SPDE. 7/22/2018
36. Workshop in International Program on Regularity Structures and Stochastic Systems, Chinese Academy of Sciences, Beijing, Title: Liouville QFT and Stochastic Ricci Flow. 7/13/2018
37. 2018 IMS Annual Meeting / 12th International Vilnius Conference on Probability Theory and Mathematical Statistics, Lithuania, invited session "Editors' pick from the Annals of Probability", Title: A central limit theorem for the KPZ equation. 7/5/2018
38. Integrable Probability FRG Conference at MIT, Boston, Title: Open ASEP and KPZ equation. 5/18/2018
39. Recent developments in Constructive Field Theory Workshop, New York, organized by J.Dubedat, F.Viklund, Title: Stochastic quantization of gauge theories. 3/14/2018
40. UBC Summer School in Probability, Vancouver, Title: Lattice gauge theory and stochastic PDE. 6/13/2017
41. Warwick EPSRC Symposium "Stochastic PDEs: Analysis and Computation", UK, organized by I.Gyongy, M.Hairer, A.Stuart, Title: Lattice gauge theory and stochastic PDE. 3/29/2017
42. 9$^{\text{th}}$ World Congress on Probability and Statistics, Toronto, Invited session talk in session "SPDEs and the work of Martin Hairer" organized by I.Corwin, Title: Stochastic quantization equations and the theory of regularity structures. 7/13/2016
43. Random Structures in High Dimensions, Oaxaca, Mexico, organized by David Brydges and Frank den Hollander, Title: "A stochastic PDE with U(1) gauge symmetry". 6/28/2016
44. Workshop on Stochastic Partial Differential Equations, Simons Center for Geometry and Physics, Stony Brook, organized by M.Hairer, Title: Some convergence results of discrete dynamics. 5/20/2016
45. Oberwolfach workshop: rough paths, regularity structures and related topics, Germany, organized by Thomas Cass, Peter Friz and Massimilliano Gubinelli, Title: SPDEs with three types of multiplicative noises; 5/5/2016
46. Columbia-Princeton Probability Day, New York, Title: Regularity structure theory and its applications; 4/8/2016
47. "Paths to, from and in renormalization: At the confluence of rough paths, algebra, analysis and geometry", Potsdam (Germany), Title: Renormalization for stochastic PDEs with non-Gaussian noises; 2/10/2016
48. Current Topics in Mathematical Physics and Probability, Sanya (China), organized by Paul Bourgade, Horng-Tzer Yau and Jun Yin, Title: Stochastic PDEs as scaling limits of some microscopic models; 12/28/2015
49. Pittsburgh workshop on Stochastic PDEs, organized by Dehua Wang, Title: Regularity structure theory and its applications; 12/4/2015
50. International Congress on Industrial and Applied Mathematics (ICIAM), Beijing, mini-symposium organized by A.Jentzen, Title: Renormalization and Stochastic PDEs, 8/11/2015
51. 38$^{\text{th}}$ Conference on Stochastic Processes and their Applications (SPA), Oxford, UK, Title: A central limit theorem for the KPZ equation (Contributed talk); 7/14/2015
52. Peking University Youth Probability Forum, Beijing, Title: Singular stochastic PDEs and the theory of regularity structures 7/7/2015

53. Random Polymers and Algebraic Combinatorics, Oxford, UK, Clay Mathematics Institute workshop organized by Ivan Corwin and Nikos Zygouras, Title: The Strict-Weak Lattice Polymer; 5/25/2015
54. MASDOC summer school "Topics in renormalisation group and regularity structures", University of Warwick, organized by S.Adams, Title: *Dynamical sine-Gordon equation*; 5/11/2015
55. 3rd Annual ERC Berlin-Oxford Young Researchers Meeting on Applied Stochastic Analysis, Weierstrass Institute, Berlin, Title: *Dynamical sine-Gordon model*; 1/27/2015
56. 13th Northeast Probability Seminar, Columbia University, Title: *Strict-Weak Polymers and KPZ Universality* 11/21/2014
57. Special Seminar on KPZ, Berkeley, Title: *Strict-weak polymers and KPZ universality*, organized by Ivan Corwin and Fraydoun Rezakhanlou 7/10/2014
58. Workshop on Harmonic Analysis and the Renormalization Group, U. of Virginia, Title: *Renormalization group by harmonic extensions*, organized by A. Abdesselam; 4/21/2014
59. Workshop on Stochastic Analysis and Related Topics, Chinese Academy of Sciences, *Renormalization and well-posedness of stochastic PDEs*, organized by Xiangdong Li; 8/6/2013

Seminar Talks

1. University of South California, CAMS colloquium. (11/20/2023)
2. MIT seminar, (10/23/2023)
3. One World Probability Seminar. (10/19/2023).
4. Penn and Temple Probability Seminar, *Stochastic quantization of Yang-Mills in 2D and 3D* (9/6/2023)
5. Beijing Institute of Technology, *Stochastic quantization of Yang–Mills* (7/28/2023)
6. MIT Probability Seminar, *Stochastic Yang–Mills dynamic in 2D and 3D*, (10/24/2022)
7. Texas Tech "Probability, Differential Geometry, and Math Physics" Seminar, *Stochastic Yang–Mills dynamic in 2D and 3D*, (10/19/2022)
8. Utah Stochastics Seminar, *Stochastic Yang–Mills process in 2D and 3D*, (10/7/2022)
9. Cambridge Seminar, *A dynamical approach to lattice Yang-Mills* (6/7/2022)
10. University of Illinois Chicago Analysis Seminar, *Dynamical approach to lattice Yang-Mills* (3/14/2022)
11. Purdue Probability Seminar, *Stochastic quantization of Yang-Mills* (3/2/2022)
12. University of Chicago Probability Seminar, *Stochastic quantization of Yang-Mills* (10/29/2021)
13. Wuhan University Stochastic analysis lecture series, *Stochastic Ricci flow* (6/7/2021)
14. Random Geometry and Statistical Physics seminar, *Stochastic Ricci flow* (4/20/2021)
15. University of Kansas Probability Seminar, *Stochastic Ricci flow* (4/14/2021)
16. Stochastic Webinar, organized by Beijing Institute of Technology / Chinese Academy of Sciences *SPDE limit of a directed polymer in Poisson random walks* (3/9/2021)
17. UCSD Probability Seminar, *Stochastic quantization and Yang-Mills* (2/25/2021)
18. Probability and the City Seminar, organized jointly by Columbia and Courant, *Stochastic quantization, large N, and mean field limit* (2/12/2021)
19. Berkeley Probability Seminar, *Stochastic quantization and Yang-Mills* (10/14/2020)
20. Beijing Institute of Technology, *Stochastic quantization of gauge theories* (12/23/2019)
21. University of Bonn Oberseminar Stochastik, *Stochastic quantization of gauge theories* (11/21/2019)
22. Warwick Probability Seminar, *Stochastic Ricci flow on surfaces* (10/16/2019)
23. Princeton Probability Seminar, *Stochastic quantization of Yang-Mills via regularity structures* (4/17/2019)
24. Rochester Probability, Ergodic Theory, Mathematical Physics Seminar, *Stochastic quantization of Yang-Mills via regularity structures* (3/29/2019)

25. Rutgers Mathematical Physics Seminar,
Stochastic quantization of Yang-Mills via regularity structures (3/14/2019)
26. UCLA Probability Seminar, *Stochastic quantization of Yang-Mills via regularity structures* (11/01/2018)
27. Columbia Probability Seminar, *Stochastic quantization of Yang-Mills below four dimensions* (10/05/2018)
28. Wisconsin-Madison Probability Seminar, *Stochastic quantization of Yang-Mills* (9/20/2018)
29. Carnegie Mellon SPDE working group, *Some new results on stochastic heat equations* (4/17/2018)
30. Carnegie Mellon University, Center for Nonlinear Analysis Seminar, *Singular stochastic PDEs and renormalization* (4/17/2018)
31. Cornell Probability Seminar, *Stochastic quantization of gauge theories* (4/10/2018)
32. Duke Probability Seminar, *Stochastic quantization of gauge theories* (3/1/2018)
33. U. of Connecticut Discrete Math and Statistical Mechanics Seminar, *Lattice Gauge Theory and Stochastic PDE* (2/22/2018)
34. Imperial College London Probability Seminar, *Six vertex model and KPZ equation* (11/21/2017)
35. Penn and Temple Probability Seminar, *Some new scaling limit results on ASEP and Glauber dynamics of spin models* (12/6/2016)
36. Wisconsin-Madison Probability Seminar, *On scaling limits of Open ASEP and Glauber dynamics of ferromagnetic models* (12/1/2016)
37. University of Toronto Probability Seminar, *Asymmetric simple exclusion processes with open boundaries and their KPZ equation limits* (10/21/2016)
38. Rutgers Seminar on Mathematical Finance, Probability and PDEs, *Stochastic PDE with U(1) gauge symmetry* (10/4/2016)
39. Chinese Academy of Sciences, *Stochastic PDEs and regularity structures* (8/5/2016)
40. U. of Chicago Probability Seminar, *Regularity structure theory and its applications* (4/15/2016)
41. Brown Dynamical System Seminar, *Regularity structure theory and its applications* (3/14/2016)
42. Harvard University Random Matrix and Probability Seminar, *The sine-Gordon stochastic PDE and regularity structures* (3/11/2016)
43. City University of New York Probability Seminar, *Regularity structure theory and its applications* (3/1/2016)
44. Institute for Advanced Study Analysis Seminar, *Stochastic quantization equations* (2/23/2016)
45. Duke University Probability seminar, *Stochastic PDEs and regularity structures* (10/29/2015)
46. U. of Macau Probability Seminar, *Stochastic PDEs and regularity structures* (8/20/2015)
47. Oxford Stochastic Analysis Seminar, *A central limit theorem for the KPZ equation* (6/15/2015)
48. Max Planck Institute at Leipzig, Analysis Seminar, *Theory of regularity structures and dynamical sine-Gordon model* (1/12/2015)
49. Cambridge Probability Seminar, *Solving the dynamical sine-Gordon equation* (10/21/2014)
50. Loughborough Probability Seminar, *The dynamical sine-Gordon equation* (10/16/2014)
51. Warwick Statistical Mechanics Seminar, *The dynamical sine-Gordon equation* (10/9/2014)
52. University of Virginia Mathematical Physics Seminar, *Renormalization group by conditional expectations and dipole gas revisited* (12/4/2013)
53. Princeton University Ergodic Theory and Statistical Mechanics Seminar, *Renormalization group and stochastic PDEs* (11/21/2013)
54. Chinese Academy of Sciences, *Rigorous Renormalization Group and Applications* (9/2011)

Organizer

- 2025/Fall, MSRI/SLMath semester program "Recent Trends in Stochastic Partial Differential Equations"
- 2024/Summer, MSRI/SLMath summer graduate school on "Stochastic Quantisation"
- 2023, 12/17–12/22, Oberwolfach Arbeitsgemeinschaft: QFT and Stochastic PDEs, (Co-organizer)
- 2022, 9/10–9/11, Graduate Student Probability Conference, (supervise organizers, the conference is supported by my NSF CAREER grant DMS-2044415)
- 2022, 7/25–7/30, Summer School on "SPDE and Related Fields", (Co-organizer)
- 2022, 6/27–6/30, IMS Annual Meeting, London, invited session on "Quantum field theory and stochastic analysis"
- 2022, 6/27–7/1, 42nd conference on Stochastic Processes and their Applications (SPA), Wuhan, contributed session "KPZ equation"
- 2021, 7/26–7/31, SPDE annual summer school, (Co-organizer)
- 2020, 8/3–8/8, SPDE summer school, (Co-organizer, joint with Chinese Academy of Sciences / Beijing Institute of Technology)
- 2019, 10/21–10/25, Workshop "Singular SPDEs and Related Topics", Hausdorff Institute for Mathematics in Bonn (Co-organizer)
- 2019, 9/23–9/27, Summer School "New Frontiers in Singular SPDEs and Scaling Limits", Hausdorff Institute for Mathematics in Bonn (Co-organizer)
- 2019, 9/14–9/15, AMS Fall Central Sectional Meeting, Special Session on "Large Scale Properties of Interacting Stochastic Systems", Madison, (Co-organized with Seppalainen and Valko)
- 2019, 7/6–7/10, Invited session on "KPZ equations and related models", IMS-China 2019, Dalian
- 2018, 5/1–5/3, Meeting on "Transport and localization in random media: theory and applications" at Columbia University, partially supported by NSF DMS-1804339 (Co-PI)
  (Co-organized with Ivan Corwin, Alexis Drouot and Michael Weinstein)
- 2016, 2/5, Semi-annual Columbia-Courant joint probability seminar, with theme on Stochastic PDEs, at Columbia University
- 2018–2022, University of Wisconsin - Madison Probability Seminar, (co-organizer)
- 2015–2018, Columbia University Probability Seminar, (co-organizer)

Journal Referee

• Annals of Probability; • Annals of Applied Probability; • Annales Henri Lebesgue; • Annales Henri Poincaré; • Archive for Rational Mechanics and Analysis; • Brazilian Journal of Probability and Statistics; • Communications in Mathematical Physics ($\geq$ 5 times); • Communications in Mathematical Sciences; • Communications in Partial Differential Equations; • Communications on Pure and Applied Mathematics; • Electronic Journal of Probability; • Forum of Mathematics, Pi; • International Mathematics Research Notices; • Journal of Evolution Equations; • Journal of Functional Analysis; • Journal of Mathematical Analysis and Applications; • Journal of Statistical Physics; • Mathematical Physics, Analysis and Geometry; • Memoirs of the AMS; • Nonlinearity; • Probability Theory and Related Fields ($\geq$ 5 times); • Science China Mathematics; • Stochastics and Partial Differential Equations: Analysis and Computations ($\geq$ 5 times); • Transactions of the AMS.

Service

Committee services at Wisconsin-Madison: Awards Committee, Graduate Admission, Graduate Advising, Graduate Program, Hiring Committee, VISP(Visiting International Student Program)/MA, and Conference/Special Lectures
Served on NSF panel for several times