Li-Cheng Tsai

Curriculum Vitae

Department of Mathematics, Columbia University
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POSITIONS

Columbia University, August 2016–
Junior Fellow of the Simons Society of Fellows
Postdoctoral Research Scientist

EDUCATION

Stanford University
Ph.D. Mathematics, June 2016
Thesis advisor: Amir Dembo

Academia Sinica, Taipei, Taiwan
Research Trainee, 2010–2011
Mentor: Tai-Ping Liu

National Taiwan University
B.S. Physics, minor in Mathematics, June 2009

AWARDS

2017 NSF grants: DMS-1712575

2016 Junior Fellow, Simons Society of Fellows

2015 Graduate Fellow, Kavli Institute for Theoretical Physics

RESEARCH INTERESTS

Asymptotic behaviors of interacting particle systems, with a focus on their interplay between partial differential equations, stochastic partial differential equations, and integrability.

PUBLICATIONS

2018 [19] Li-Cheng Tsai. Exact lower tail large deviations of the KPZ equation. *Submitted.* *arXiv:1809.03410*

[18] Hao Shen and Li-Cheng Tsai. Stochastic Telegraph Equation Limit for the Stochastic Six Vertex Model. *Submitted.* *arXiv:1807.04678*

[17] Ivan Corwin and Li-Cheng Tsai. SPDE Limit of Weakly Inhomogeneous ASEP. *Submitted.* *arXiv:1806.09682*

[16] Ivan Corwin, Promit Ghosal, Alexandre Krajenbrink, Pierre Le Doussal, and Li-Cheng Tsai. Coulomb-gas electrostatics controls large fluctuations of the KPZ equation. *Phys. Rev. Lett. 121, 060201*

[15] Ivan Corwin, Promit Ghosal, Hao Shen, and Li-Cheng Tsai. Stochastic PDE Limit of the Six Vertex Model. *Submitted.* *arXiv:1803.08120*

[14] Yu Gu and Li-Cheng Tsai. Another look into the Wong-Zakai Theorem for Stochastic Heat Equation. *Submitted.* *arXiv:1803.08120*

[13] Li-Cheng Tsai. Stationary Distributions of the Atlas Model. *Electron. C. Probab. 23 (10)*

[12] Ivan Corwin and Hao Shen. ASEP(q, j) converges to the KPZ equation. *Ann. Inst. Henri Poincaré (B) Probab. Stat. 54(2) 995-1012*

[11] Wenpin Tang and Li-Cheng Tsai. Optimal Surviving Strategy for Drifted Brownian Motions with Absorption. *Ann. Prob. 46(3) 1597-1650*

2017 [10] Stefano Olla and Li-Cheng Tsai. Exceedingly Large Deviations of the Totally Asymmetric Exclusion Process. *Submitted.* *arXiv:1708.07052*

[9] Amir Dembo and Li-Cheng Tsai. The Criticality of a Randomly-Driven Front. *Submitted.* *arXiv:1705.10017*

[8] Andrey Sarantsev and Li-Cheng Tsai. Stationary Gap Distributions for Infinite Systems of Competing Brownian Particles. *Electron. J. Probab. 22 (56)*

[7] Amir Dembo and Li-Cheng Tsai. Equilibrium Fluctuation of the Atlas Model. *Ann. Prob. 45(6B) 4529-4560*

[6] Ivan Corwin and Li-Cheng Tsai. KPZ equation limit of higher-spin exclusion processes. *Ann. Prob. 45(3) 1771-1798*

2016 [5] Li-Cheng Tsai. Infinite Dimensional Stochastic Differential Equations for Dyson's Model. *Probab. Theory Related Fields 166(3)801-850*

[4] Amir Dembo and Li-Cheng Tsai. Weakly Asymmetric Non-Simple Exclusion Process and the Kardar-Parisi-Zhang Equation. *Comm. Math. Phys. 341(1)219-261*

2014 [3] Hung-Wen Kuo, Tai-Ping Liu, and Li-Cheng Tsai. Equilibrating effects of boundary and colllision in rarefied gases. *Comm. Math. Phys., 328(2)421-480*

2013 [2] Hung-Wen Kuo, Tai-Ping Liu, and Li-Cheng Tsai. Free Molecular Flow with Boundary Effect. *Comm. Math. Phys., 318(2)375-409*

2011 [1] Li-Cheng Tsai. Viscous Shock Propagation with Boundary Effect. *Bull. Inst. Math. Acad. Sin. (N.S.) 6(1)1-25*

INVITED TALKS

2018 Probability Seminar, University of Toronto, October

Probability Seminar, University of Utah, October

Probability Seminar, UC San Diego, October

Probability Seminar, UC Irvine, October

Probability Seminar, University of Washington, October

Probability Seminar, UC Davis University, October

Probability Seminar, Cornell University, October

New Trends in Stochastic Analysis, Chinese Academy of Science, Beijing, September
Interacting Particle Systems and Parabolic PDEs, Banff, August
Integrable probability focus research group, MIT, May
Probability Seminar, the City University of New York, March
Probability Seminar, University of Virginia, February
Applied Math Seminar, Stanford University, January

2017 Probability Seminar, University of Minnesota, December
Mathematical Congress of the Americas, Montreal, July
Probability Seminar, University of Toronto, April
Probability Seminar, Duke University, March

2016 Probability Seminar, Brown University, October
Columbi-Courant Probability Seminar, NYU, October
Probability Seminar, University of Washington, April
Probability Seminar, Northwestern University, April

2015 Probability Seminar, Stanford University, November
Probability Seminar, Kyushu University, Japan, November
Stochastic Analysis on Large Scale Interacting Systems, RIMS, Japan, October
Random Matrix and Probability Theory Seminar, Harvard University, September
Probability Seminar, Columbia University, September
Stochastic Portfolio Theory and related topics, May

2014 Probability Seminar, Princeton University, November
Probability Seminar, Columbia University, November
Stochastic Integrable Systems Reading Seminar, University of Warwick, June

2013 Student Probability/PDE Seminar, UC Berkeley, March

CONFERENCES

2018 New Trends in Stochastic Analysis, Beijing
Interacting Particle Systems and Parabolic PDEs, Banff
International Congress on Mathematical Physics, Montreal
Integrable probability focus research group, MIT

2017 Mathematical Congress of the Americas, Montreal

2016 Quantum integrable systems, conformal field theories and stochastic processes, Institut d'Études Scientifiques de Cargèse, Corsica
New approaches to non-equilibrium and random systems: KPZ integrability, universality, applications and experiments, Kavli Institute for Theoretical Physics, Santa Barbara

2015 Stochastic Analysis on Large Scale Interacting Systems, RIMS, Kyoto
Stochastic Analysis: Around the KPZ Universality Class, Oberwolfach
Seminar on Stochastic Processes, UC San Diego

TEACHING EXPERIENCE

Columbia University
- Lecturer, Calculus II, Fall 2017
- Overall assessment of the effectiveness of the instructor: 4.0/5

Stanford University
- Section Leader, ODE with Linear Algebra, Winter 2015
- Section Leader, Calculus (accelerated), Winter 2014
- Section Leader, Calculus (accelerated), Fall 2012

REFEREE SERVICE

Referee, Annals of Applied Probability

Referee, Probability Surveys

Referee, Probability Theory and Related Field