Wai-Kit Lam

EDUCATION

Indiana University, Bloomington

Ph.D. in Mathematics, 2013 - 2018

Advisor: Michael Damron
Dissertation Topic: Topics in critical and first-passage percolation

The Chinese University of Hong Kong

M.Phil. in Mathematics, 2011 - 2013

Advisor: De-Jun Feng
Dissertation Topic: Arithmetic properties of certain sets of fractional dimension

B.Sc. in Mathematics, 2008 - 2011

EMPLOYMENT

National Taiwan University

Assistant Professor, 2021 -

University of Minnesota

Dunham Jackson Assistant Professor, 2018 - 2021

PUBLICATIONS/ PREPRINTS

(With M. Damron, J. Hanson and D. Harper) Exceptional behavior in critical first-passage percolation and random sums. `arXiv:2308.10114`

(With W.-K. Chen) Universality of superconcentration in the Sherrington-Kirkpatrick model. To appear in *Random Structures Algorithms*. `arXiv:2302.04158`

(With A. Sen) Central limit theorem in disordered monomer-dimer model. `arXiv:2208.02151`

(With M. Damron, J. Gold and X. Shen) On the number and size of holes in the growing ball of first-passage percolation. To appear in *Trans. Amer. Math. Soc.* `arXiv:2205.09733`

(With M. Damron, J. Hanson and D. Harper) Transitions for exceptional times in dynamical first-passage percolation. *Probab. Theory Related Fields.* 185, 1039–1085 (2023).

(With P. Nolin) Near-critical avalanches in 2D frozen percolation and forest fires. `arXiv:2106.10183`

(With M. Damron, C. Janjigian and X. Shen) Tail bounds for the averaged empirical distribution on a geodesic in first-passage percolation. `arXiv:2010.08072`

(With W.-K. Chen) Universality of approximate message passing algorithms. *Electron. J. Probab.* 26 (2021), Paper No. 36, 44 pp.

(With M. Damron and J. Hanson) Universality of the time constant for 2D critical first-passage percolation. *Ann. Appl. Probab.* 33 (2023), no. 3, 3184–3214.

(With W.-K. Chen) Order of fluctuations of the free energy in the SK model at critical temperature. *ALEA Lat. Am. J. Probab. Math. Stat.* 16 (2019), no. 1, 809–816.

(With M. Damron and J. Hanson) The size of the boundary in first-passage percolation. *Ann. Appl. Probab.* 28 (2018), no. 5, 3184–3214.

(With M. Damron and X. Wang) Asymptotics for 2D critical first passage percolation. *Ann. Probab.* 45 (2017), no. 5, 2941–2970.

Awards and Grants

NTU New Faculty Founding Research Grant NTU-111L7452, Jan. 2021 - Dec. 2021.
NSTC Grant 110-2115-M-002-012-MY3, Nov. 2021 - July 2024, "Extremal and critical behaviors of stochastic models".
Thank a Teacher Note, University of Minnesota, Fall 2019 & Spring 2020.
College of Arts and Sciences Travel Award, Indiana University, 2016.
William B. Wilcox Mathematics Award, Indiana University, 2015.
James P. Williams Memorial Award, Indiana University, 2014.
AMS Graduate Student Travel Grant, 2014.
College of Arts and Sciences Top Up Award, Indiana University, 2013.

Research talks/ Presentations

Random Interacting Systems, Scaling Limits, and Universality, National University of Singapore (Dec. 2023)
The 32th South Taiwan Statistics Conference (June 2023)
The 34th International Meeting on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms (June 2023)
Colloquium, National Cheng Kung University (June 2023)
2023 Spring Probability Workshop (May 2023)
Probability and Related Fields Seminar, Academia Sinica (Dec. 2022)
Colloquium, National Tsing Hua University (Nov. 2022)
2022 Winter Workshop on Probability and Related Fields, NCTS (Nov. 2022)
THU-PKU-BNU Joint Probability Webinar (Oct. 2022)
Workshop on Random Structures and Related Topics, Institute of Mathematics, VAST (July 2022; invited talk, not able to attend due to pandemic)
2022 Chung Hsing Workshop in Probability and Related Fields (Apr. 2022)
2021 TMS Annual Meeting (Jan. 2022)
Colloquium, National Chengchi University (Dec. 2021)
Seminar, The Chinese University of Hong Kong (Aug. 2021)
Bernoulli-IMS 10th World Congress in Probability and Statistics (July 2021)
Junior Integrable Probability Seminar (Apr. 2021)
Probability Seminar, CUNY (Mar. 2021)
University of Cambridge (Feb. 2021)
Special Colloquium, Academia Sinica (Dec. 2020)
National Taiwan University (Nov. 2020)
Weierstrass Institute for Applied Analysis and Stochastics (Oct. 2020)
Bernoulli-IMS One World Symposium 2020 (Aug. 2020)
Northwestern University-University of Minnesota Joint Probability Seminar (Sep. 2020)
Probability and Related Fields Seminar, Indiana University (Feb. 2020)
Probability Seminar, University of Minnesota (Jan. 2020)
AMS Sectional Meeting, Binghamton University (Oct. 2019)
Stochastic Processes and their Applications 2019, Northwestern University (July 2019)
(Poster presentation) Interacting Particle Systems, Statistical Mechanics, and Related Topics, UCLA (Mar. 2019)
Functional Analysis Seminar, University of Pittsburgh (Oct. 2018)
Probability Seminar, University of Minnesota (Sep. 2018)
Probability Seminar, University of Illinois at Urbana–Champaign (Mar. 2018)
Seminar, The Chinese University of Hong Kong (May 2017)

AMS Joint Math Meetings, Atlanta (Jan. 2017)
Probability and Related Fields Seminar, Indiana University (Oct. 2016)
Seminar, The Chinese University of Hong Kong (July 2016)
Seminar, The Chinese University of Hong Kong (Nov. 2012)

Expository talks

Random growth models
Math Club, National Taiwan University (Fall 2023)

Several talks on first-passage percolation
NCTS probability seminar (Spring 2022, Fall 2022)
Probability/mathematical physics learning seminar, University of Minnesota (Spring 2019)

Several talks on random matrix theory
Graduate student seminar: Random matrix theory, Indiana University (Spring 2018)

Fourier decay of measures
Graduate student analysis seminar, Indiana University (Nov. 2015)

Commutative Banach algebras
Student seminar, The Chinese University of Hong Kong (July 2015)

Arithmetic progressions in sets of fractional dimension
Seminar, The Chinese University of Hong Kong (Mar. 2012)

Conferences/ Workshops Participation

Random Interacting Systems, Scaling Limits, and Universality, National University of Singapore (Dec. 2023)
43rd Conference on Stochastic Processes and their Applications, Lisbon (July 2023)
The 32th South Taiwan Statistics Conference (June 2023)
The 34th International Meeting on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms (June 2023)
2023 Spring Probability Workshop, NCTS (May 2023)
2022 Winter Workshop on Probability and Related Fields, NCTS (Nov. 2022)
First-passage Percolation and Related Models, ICTS (July 2022)
2022 Chung Hsing Workshop in Probability and Related Fields (Apr. 2022)
Inhomogeneous Random Systems (Jan. 2022)
2021 TMS Annual Meeting (Jan. 2022)
Workshop on Probabilistic Methods in Statistical Mechanics of Random Media and Random Fields 2022 (Jan. 2022)
Bernoulli-IMS 10th World Congress in Probability and Statistics (July 2021)
Stochastic Spatial Processes Conference, Ohio State University (Mar. 2021)
42nd Midwest Probability Colloquium, Northwestern University (Oct. 2020)
Bernoulli-IMS One World Symposium 2020 (Aug. 2020)
AMS Joint Math Meetings, Denver (Jan. 2020)
AMS Sectional Meeting, Binghamton University (Oct. 2019)
41st Midwest Probability Colloquium, Northwestern University (Oct. 2019)
Stochastic Processes and their Applications 2019, Northwestern University (July 2019)
Mathematics Research Communities: Stochastic Spatial Models, Whispering Pines (June 2019)
2019 Spring Probability Workshop, Academia Sinica (May 2019)
Interacting Particle Systems, Statistical Mechanics, and Related Topics, UCLA (Mar. 2019)
Spin Glasses and Related Topics, BIRS (Oct. 2018)
Workshop on Fractal Geometry and Related Topics, CUHK (May 2018)
Wabash Modern Analysis Seminar, Wabash College (Feb. 2018)
AMS Sectional Meeting, Indiana University (Apr. 2017)
AMS Joint Math Meetings, Atlanta (Jan. 2017)
School and Workshop on Random Interacting Systems, University of Bath (June 2016)

Midwest Workshop on Asymptotic Analysis, Indiana University (Oct. 2015)
AMS Sectional Meeting, Michigan State University (Mar. 2015)
International Conference on Advances on Fractals and Related Topics, CUHK (Dec. 2012)
Workshop on Fractals and Related Fields, CUHK (Feb. 2012)
Kyoto University/CUHK Joint Workshop on Analysis and Geometry of Fractals and Metric Measure Spaces, CUHK (Mar. 2010)

Teaching Experience

At NTU:

Fall	2023	Analysis (Honors) I.
Spring	2023	Probability Theory (II).
Fall	2022	Probability Theory (I).
Spring	2022	Introduction to Probability Theory.
Fall	2021	High-dimensional probability.

USRP (Undergraduate Summer Research Program):

Summer	2022	Planar statistical physics: Bernoulli percolation (with Jhih-Huang Li).

At UMN:

Spring	2021	MATH 5652 Introduction to Stochastic Processes.
Fall	2020	MATH 5651 Basic Theory of Probability and Statistics (two sections).
Spring	2020	MATH 5652 Introduction to Stochastic Processes.
Fall	2019	MATH 5652 Introduction to Stochastic Processes (two sections).
Spring	2019	MATH 5651 Basic Theory of Probability and Statistics.
Fall	2018	MATH 5651 Basic Theory of Probability and Statistics (two sections).

At IU:

Fall	2017	MATH-D116 Introduction to Finite Mathematics.
Fall	2016	MATH-M018 Basic Algebra for Finite Mathematics (two sections).

Editorial service

Grant proposal reviewer for NSTC.

Refereed articles for Annales de l'Institut Henri Poincaré, Communications in Mathematical Physics, Communications of the American Mathematical Society, Electronic Communications in Probability, Electronic Journal of Probability, Geometric and Functional Analysis, Journal of Statistical Physics, and some conference proceedings.

Reviewed articles for Mathscinet.

Service

Co-organizer, Probability seminar, National Taiwan University (Fall 2023 –)
Organizer, Probability reading seminar, National Taiwan University (Fall 2022 –)
Co-organizer, Probability seminar, University of Minnesota (Fall 2018 – Spring 2021)
Organizer, Graduate student seminar: Random matrix theory, Indiana University (Spring 2018)
Student helper and organizer, Directed Reading Program, Indiana University (Spring 2016)

Mentoring

Current master's students: Tzu-Han Chou, Chun Long Cheung, Yung-Xin Chang

Past master's student: Te-Lun Lu