

# Curriculum Vitae

## SWEE HONG CHAN

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### Education/Employment

- 2022 – **Assistant Professor** (tenure-track), Rutgers University
- 2019 – 2022 **Hedrick Assistant Professor** (postdoc), UCLA (mentor: Igor Pak)
- 2014 – 2019 **Ph.D** student in Mathematics, Cornell University (advisor: Lionel Levine)
- 2014 – 2016 **M.S.** (Special) in Mathematics, Cornell University
- 2012 – 2014 Research Assistant, Nanyang Technological University (mentor: Dmitrii V. Pasechnik)
- 2008 – 2012 **B. Sc.** in Mathematical Sciences, Nanyang Technological University (with Honors)

### Awards and Fellowships

- 2022 UCLA Liggett Instructor Teaching Award
- 2021 – now AMS Simons Travel Grant
- 2017 – 2018 Robert John Bättig Graduate Prize, awarded to a Cornell graduate student based on excellence and promise in mathematics
- 2014 Cornell Graduate Student Recruiting Fellowship
- 2012 The Singapore Mathematical Society Gold Medal and Book Prize, Nanyang Technological University, for best overall performance in Bachelor of Science (Mathematics)
- 2009 – 2012 International Mathematical Competition for University Students, First Prize (2012), Second Prize (2010,2011), Honorable Mention (2009)

### Research interests

Combinatorics and Probability

### Preprints

- 21. S. H. Chan and I. Pak, Multivariate correlation inequalities for  $P$ -partitions, 21 pp., [arXiv:2212.11954](https://arxiv.org/abs/2212.11954).
- 20. S.H. Chan and I. Pak, Correlation inequalities for linear extensions, 23 pp. [arXiv:2211.16637](https://arxiv.org/abs/2211.16637)
- 19. S.H. Chan, I. Pak, and G. Panova, Effective poset inequalities, 36 pp. [arXiv:2205.02798](https://arxiv.org/abs/2205.02798)
- 18. S. H. Chan and I. Pak, Log-concave poset inequalities, 71 pp. [arXiv:2110.10740](https://arxiv.org/abs/2110.10740).  
Extended abstract: *Sém. Lothar. Combin.* **86B** (2022), no. 9, 12 pp. [Link](#)

### Journal publications

- 17. S. H. Chan and I. Pak, Introduction to the combinatorial atlas, 28 pp,  
*Expo. Math.* **40** (2022), 1014–1048. [arXiv:2203.01533](https://arxiv.org/abs/2203.01533).
- 16. S.H. Chan, I. Pak, and G. Panova, The cross-product conjecture for width two posets,  
*Trans. Amer. Math. Soc.* **375** (2022), 5923–5961, [arXiv:2104.09009](https://arxiv.org/abs/2104.09009)
- 15. S.H. Chan, I. Pak, and G. Panova, Log-concavity in planar random walks, 8 pp,  
to appear in *Combinatorica*, [arXiv:2106.10640](https://arxiv.org/abs/2106.10640)
- 14. S.H. Chan, I. Pak, and G. Panova, Extensions of the Kahn–Saks inequality for posets of width two, 23 pp,  
to appear in *Comb. Theory*, [arXiv:2106.07133](https://arxiv.org/abs/2106.07133)
- 13. S. H. Chan, Recurrence of horizontal-vertical walks, 34 pp,  
to appear in *Ann. Inst. Henri Poincaré Probab. Stat.*, [arXiv:2012.10811](https://arxiv.org/abs/2012.10811)

12. S. H. Chan and L. Levine, Abelian networks IV. Dynamics of nonhalting networks, *Mem. Amer. Math. Soc.* **276** (2022), no. 1358, vii+89 pp. [arXiv:1804.03322](#)
11. S.H. Chan, I. Pak, and G. Panova, Sorting probability for large Young diagrams, *Discrete Anal.* (2021), no. 24, 57 pp. [arXiv:2005.08390](#)
10. S. H. Chan, L. Greco, L. Levine, and P. Li, Random walks with local memory, *J. Stat. Phys.* **84** (2021), no. 6, 28 pp. [arXiv:1809.04710](#)
9. S.H. Chan, I. Pak, and G. Panova, Sorting probability of Catalan posets, *Adv. in Appl. Math.* **129** (2021), no. 102201, 13 pp. [arXiv:2005.13686](#)
8. S. H. Chan, Infinite-step stationarity of rotor walk and the wired spanning forest, *Proc. Amer. Math. Soc.* **149** (2021), 2415–2428. [arXiv:1909.13195](#)
7. S. H. Chan, A rotor configuration with maximum escape rate, *Electron. Commun. Probab.* **25** (2020), no. 19, 5pp. [arXiv:1810.12784](#)
6. S. H. Chan, Rotor walks on transient graphs and the wired spanning forest, *SIAM J. Discrete Math.* **33** (2019), 2369–2393. [arXiv:1809.09790](#)
5. S. H. Chan, A bijection between necklaces and multisets with divisible subset sum, *Electron. J. Combin.* **26** (2019), P1.37, 18 pp. [arXiv:1802.03507](#)
4. S. H. Chan, Abelian sandpile model and Biggs-Merino polynomial for directed graphs, *J. Combin. Theory Ser. A* **154** (2018), 145–171. [arXiv:1412.4837](#)
3. M. Aguiar and S. H. Chan, Toric arrangements associated to graphs: extended abstract, *Sém Lothar. Combin.* **78B** (2017), no. 84, 12 pp. [Link](#)
2. S. H. Chan, Quasi-periodic tiling with multiplicity: a lattice enumeration approach, *Discrete Computat. Geom.* **54** (2015) 647–662. [arXiv:1405.6928](#)
1. S. H. Chan, H. Hollmann and D. Pasechnik, Sandpile groups of generalized de Bruijn and Kautz graphs and circulant matrices over finite fields, *J. Algebra* **421** (2015), 268–295. [arXiv:1405.0113](#)

### Talks

- 2022 Nov. 2022–2023 Matroids – Combinatorics, Algebra and Geometry Seminar, Toronto, Canada, *Combinatorial Atlas for Log-concave Inequalities*
- 2022 Oct. Rutgers University, Discrete Mathematics Seminar, Piscataway, USA, *Log-concavity and Cross Product Inequalities in Order Theory*
- 2022 Oct. Rutgers University, Experimental Mathematics Seminar, Piscataway, USA, *Sorting probability for Young diagrams*
- 2022 Oct. UC Davis Algebra and Discrete Mathematics Seminar, Davis, USA, *Combinatorial Atlas for Log-concave Inequalities*
- 2022 Sep. Rutgers University, Research Glimpse Talks for Graduate Students, Piscataway, USA, *Combinatorial Aspects of Log-concave Inequalities*
- 2022 Jul. The 34th International Conference on Formal Power Series and Algebraic Combinatorics (FPSAC 2022), Bangalore, India. *Combinatorial Atlas for Log-concave Inequalities*
- 2022 Jun. University of Waterloo Tutte Colloquium, Waterloo, Canada, *Combinatorial Atlas for Log-concave Inequalities*
- 2022 Jun. Göran Gustafsson Symposium, Institut Mittag-Leffler, Sweden, *Combinatorial Atlas for Log-concave Inequalities*
- 2022 Apr. University of Massachusetts Amherst Discrete Mathematics Seminar, Amherst, USA, *Combinatorial Atlas for Log-concave Inequalities*
- 2022 Mar. UMN Combinatorics Seminar, Minneapolis, USA, *Combinatorial Atlas for Log-concave Inequalities*

- 2022 Mar. Brown Combinatorics Seminar, Providence, USA, *Combinatorial Atlas for Log-concave Inequalities*
- 2022 Feb. California Institute of Technology, Los Angeles Probability Forum, Pasadena, USA, *Combinatorial Atlas for Log-concave Inequalities*
- 2021 Nov. University of Washington, Combinatorics and Geometry Seminar, Seattle, USA, *Combinatorial Atlas for Log-concave Inequalities*
- 2021 Oct. Cornell University, Discrete Geometry and Combinatorics Seminar, Ithaca, USA, *Combinatorial Atlas for Log-concave Inequalities*
- 2021 Oct. UC Berkeley, Combinatorics Seminar, Berkeley, USA, *Combinatorial Atlas for Log-concave Inequalities*
- 2021 Sep. UCLA, Combinatorics Seminar, Los Angeles, USA, *Combinatorial Atlas for Log-concave Inequalities*
- 2021 Sep. Rutgers University, Discrete Mathematics Seminar, Piscataway, USA, *Log-concave Inequality for Posets*
- 2021 Sep. Princeton University, Discrete Mathematics Seminar, Princeton, USA, *Log-concave Inequality for Posets*
- 2021 Sep. Cornell University, Probability Seminar, Ithaca, USA, *Sorting probability for Young diagrams*
- 2021 Apr. University of Illinois at Chicago, Combinatorics and Probability Seminar, Chicago, USA, *Sorting probability for Young diagrams*
- 2021 Mar. Purdue University Probability seminar, West Lafayette, USA, *Performing random walks without any randomness*
- 2020 Dec. Cornell University: Topics in Probability , Ithaca, USA, *In between random walk and rotor walk*
- 2020 Dec. Southern California Probability Symposium , Los Angeles, USA, *Sorting probability for Young diagrams*
- 2020 Nov. CUNY Probability Seminar, New York, USA, *Sorting probability for Young diagrams*
- 2020 Oct. UCLA Combinatorics Seminar, Los Angeles, USA, *Sorting probability for Young diagrams*
- 2020 Jan. UCSD Combinatorics Seminar, San Diego, USA, *Performing random walks without any randomness*
- 2019 Dec. USC Combinatorics Seminar, Los Angeles, USA, *Rotor walk and escaping from prison*
- 2019 Oct. UCLA Probability Seminar, Los Angeles, USA, *Random walks with local memory in the square lattice*
- 2018 Nov. Duke Probability Seminar, Durham, USA, *Random walks with local memory in the square lattice*
- 2018 Sep. Penn/Temple Probability Seminar, Philadelphia, USA, *In between random walk and rotor walk in the square lattice*
- 2018 June Fifth IMS Asia Pacific Rim Meeting (IMS-APRM), Singapore, Singapore, *In between random walk and rotor walk in the square lattice*
- 2018 April Graduate Student Combinatorics Conference, Dallas, USA. *Necklaces and subset-sums: How can they be related?*
- 2018 March Princeton Topics in Probability Seminar, Princeton, USA. *In between random walk and rotor walk in the square lattice*
- 2017 Nov. Binghamton Combinatorics Seminar, Binghamton, USA. *Toric arrangements that come from graphs*
- 2017 Nov. 2017 Northeast Probability Seminar, New York City, USA. *Random walks with local memory on the square lattice*
- 2017 Aug. Pacific Rim Mathematical Association (PRIMA) Third Congress, Oaxaca, Mexico. *Toric arrangements that come from graphs*

- 2017 July The 29th International Conference on Formal Power Series and Algebraic Combinatorics (FPSAC 2017), London, UK. *Toric arrangements associated to graphs*
- 2017 April Finger Lakes Probability Seminar, Syracuse, USA. *Random walks with local memory on the square lattice*
- 2017 April Graduate Student Combinatorics Conference, Kansas, USA. *Toric graphic arrangements*
- 2015 Nov. Banff International Research Station Workshop on Sandpile Groups, Oaxaca, Mexico. *Abelian networks and a weak version of Merino's theorem*
- 2015 May Connections in Discrete Mathematics, Vancouver, BC, Canada. *Greedoid polynomial, chip-firing, and G-parking function for directed graphs*
- 2013 Sep. The Seventh European Conference on Combinatorics, Graph Theory and Applications (Eurocomb 2013), Pisa, Italy. *Critical groups of generalized de Bruijn and Kautz graphs and circulant matrices over finite fields*

### Outreach activities

- 2022 – [Olga Radko Math Circle](#), Steering Committee, UCLA
- 2022 Summer CSU-UCLA Mathematics Summer Bridge Program, Co-organizer, UCLA  
An annual summer program at UCLA to encourage and strengthen the PhD applications of participants from CSU Northridge, Cal State LA and CSU San Bernardino
- 2021 – 2022 [Olga Radko Math Circle](#), Deputy Director, UCLA  
Handling administrative duties and developing materials that aims to introduce advanced mathematics to students at all level in a fun and accessible manner.
- 2021 Summer [Research in Industrial Projects for Students \(RIPS\)](#), Academic Mentor, [Institute of Pure and Applied Mathematics \(IPAM\)](#)
- 2020 – 2021 [Olga Radko Math Circle](#), Curriculum and Instructional Supervisor, UCLA  
Supervising instructors and developing materials for the math circle's advanced group, with a focus on introducing advanced mathematics to talented high school students.
- 2019 May [Math Explorer's Club](#), Instructor, Cornell University  
Introducing *Markov chain and its applications* to middle and high school students through interactive and fun activities.

### Teaching activities

- 203 Spring Graph Theory (16:640:428:02), Instructor, Rutgers University
- 2022 Fall Graph Theory (16:642:581), Instructor, Rutgers University
- 2022 Spring Probability Theory II (MATH 170B), Instructor, UCLA
- 2022 Winter Introduction to Probability and Statistics II (MATH 170S), Instructor, UCLA
- 2021 Spring Introduction to Probability and Statistics II (MATH 170S), Instructor, UCLA
- 2021 Winter Introduction to Probability and Statistics I (MATH 170E), Instructor, UCLA
- 2020 Fall Introduction to Probability and Statistics II (MATH 170S), Instructor, UCLA
- 2020 Spring Introduction to Probability and Statistics II (MATH 170S), Instructor, UCLA
- 2020 Winter Enumerative Combinatorics (MATH 184), instructor, UCLA
- 2019 Fall Introduction to Probability and Statistics I (MATH 170E), Instructor, UCLA
- 2019 Spring Calculus II (MATH 1120), instructor, Cornell University
- 2018 Fall Probability Theory I (MATH 6710), Teaching Assistant, Cornell University
- 2018 Spring Probability Theory II (MATH 6720), teaching assistant, Cornell University
- 2017 Fall Calculus II (MATH 1120), Instructor, Cornell University
- 2017 Spring Applicable Algebra (MATH 3360), Teaching Assistant, Cornell University
- 2016 Spring Probability Theory II (MATH 6720), Teaching Assistant, Cornell University
- 2015 Fall Linear Algebra for Engineers (MATH 2940), Teaching Assistant, Cornell University

- 2014 Spring Mathematical Problem Solving (MH9000), Instructor, Nanyang Technological University
- 2013 Fall Calculus III (MH2100), Teaching Assistant, Nanyang Technological University
- 2013 Spring Calculus II (MH1101), Teaching Assistant, Nanyang Technological University
- 2012 Fall Calculus for the Science I (MH1800), Teaching Assistant, Nanyang Technological University

**Organizing activities**

- 2023 [Formal Power Series and Algebraic Combinatorics 2023](#), Program Committee
- 2021 April [Sixth Southern California Discrete Math Symposium](#), Co-organizer (with Asaf Ferber)
- 2019 – 2022 [UCLA Combinatorics Seminar](#), Co-organizer (with Igor Pak and Pavel Galashin)
- 2017 – 2019 [Cornell Probability Seminar](#), Co-organizer (with Lionel Levine, Philippe Sosoe, and Pierre Patie)

**Other professional activities**

- 2022 – 2023 Graduate Admission Committee, Math Department, Rutgers University
- 2021 – 2022 Equity Diversity Inclusion Committee, Math Department, UCLA
- 2020 – 2021 Course Development Teaching Committee, Math Department, UCLA

**Journals refereed**

Advances in Mathematics  
Advances in Applied Mathematics  
Discrete and Computational Geometry  
Discrete Applied Mathematics  
Discrete Mathematics  
Electronic Journal of Combinatoris  
European Journal of Combinatoris  
Journal of Theoretical Probability  
Journal of Combinatorial Theory, Series A  
Linear Algebra and its Applications  
Proceedings of the National Academy of Sciences  
Random Structures & Algorithms  
SIAM Journal of Discrete Mathematics  
The Australasian Journal of Combinatorics  
Transactions of the American Mathematical Society