

Michael Simkin | Harvard University

CONTACT INFORMATION

Harvard University
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PERSONAL INFORMATION

Birthyear: 1985
Citizenship: Canada, Israel, USA
Languages: English, Hebrew

RESEARCH INTERESTS

Probabilistic combinatorics, combinatorial designs, random graphs and hypergraphs, and related computational questions.

EMPLOYMENT

Harvard University

- 2020 - Present: Postdoctoral fellow, Center of Mathematical Sciences and Applications.

EDUCATION

Hebrew University of Jerusalem, Israel

- 2014 - 2020: PhD, Einstein Institute of Mathematics and Federmann Center for the Study of Rationality. Adviser: Prof. Nati Linial.
- 2011 - 2014: MSc **magna cum laude** in mathematics. Adviser: Prof. Gil Kalai.
- 2008 - 2011: BSc **summa cum laude** in Amirim honors program, major in mathematics, minor in computer science, and significant coursework in physics.

PUBLICATIONS

Preprints

- Threshold for Steiner triple systems, with Ashwin Sah and Mehtaab Sawhney. *arXiv:2204.03964* (2022).
- High-girth Steiner triple systems, with Matthew Kwan, Ashwin Sah, and Mehtaab Sawhney. *arXiv:2201.04554* (2022).
- The number of n -queens configurations. *arXiv:2107.13460* (2021).
- $(n, k, k - 1)$ -Steiner systems in random hypergraphs. *arXiv:1711.01975* (2017).

Published/Accepted

- Substructures in Latin squares, with Matthew Kwan, Ashwin Sah, and Mehtaab Sawhney. *Israel Journal of Mathematics* (to appear) *arXiv:2202.05088* (2022).
- A lower bound for the n -queens problem, with Zur Luria. *Proceedings of the 2022 Annual ACM-SIAM Symposium on Discrete Algorithms* (SODA 2022).
- What is learned in knowledge graph embedding?, Michael R. Douglas, Michael Simkin, Omri Ben-Eliezer, Tianqi Wu, Peter Chin, Trung V. Dang, Andrew Wood. *Complex Networks & Their Applications X* (CNA 2021).

- Perfect matchings in random subgraphs of regular bipartite graphs, with Roman Glebov and Zur Luria. *Journal of Graph Theory*, 97: 208-231 (2021).
- A randomized construction of high girth regular graphs, with Nati Linial. *Random Structures & Algorithms*, 58; 345-369 (2021).
- The threshold problem for Latin boxes, with Zur Luria. *Random Structures & Algorithms*, 55; 926-949 (2019).
- Monotone subsequences in high-dimensional permutations, with Nati Linial. *Combinatorics, Probability, and Computing*, 27(1): 69-83 (2018).

HONORS AND AWARDS

2022 AMS-Simons Travel Grant
 2018 Klein Prize (Fourth year PhD)
 2015 Klein Prize (First year PhD)
 2014 Awarded MSc magna cum laude
 2011 Awarded BSc summa cum laude
 2011 Dean's prize (third year BSc)
 2009 Dean's prize (first year BSc)

TEACHING EXPERIENCE

2022: Research mentor, Harvard CMSA Introduction to Mathematical Research.

2015 - 2020: Teaching Assistant, Hebrew University of Jerusalem:

- Spring 2020: Discrete mathematics
- Spring 2019: Linear Algebra 2
- Fall 2019, Fall 2018, Fall 2017, Fall 2016: Mathematical Tools in Computer Science
- Spring 2018: Linear Algebra 1
- Spring 2017, Fall 2015: Advanced Calculus for Computer Science Students
- Spring 2016, Spring 2015: Calculus 2 for Computer Science Students

2016 - 2017: Lecturer, Israeli Ministry of Education for elementary school mathematics teachers.

ADDITIONAL EXPERIENCE

2021 - Present Organizer, Harvard CMSA combinatorics, physics, and probability seminar.
 2021 - Present Organizer, Harvard CMSA colloquium.
 2017 - 2020 Librarian, Federmann Center for the Study of Rationality.

NON-ACADEMIC EMPLOYMENT

2012 - 2014: Firmware engineer, Intel Corporation.

TALKS

- Algorithms, Combinatorics, and Optimization Seminar, Carnegie Mellon University, April 2022.
- Tel-Aviv University combinatorics seminar, April 2022
- Technion combinatorics seminar, April 2022.
- Hebrew University combinatorics seminar, April 2022.
- Bar-Ilan combinatorics seminar, April 2022.
- University of British Columbia discrete mathematics seminar, March 2022.
- Brandeis University combinatorics seminar, January 2022.
- Symposium on Discrete Algorithms (SODA), January 2022.
- Complex Networks & their Applications (CNA), December 2021.

- Worcester Polytechnic Institute Discrete Mathematics Seminar, October 2021.
- University of Bristol Combinatorics Seminar, October 2021.
- Auburn University Discrete Mathematics Seminar, October 2021.
- MIT Combinatorics Seminar, October 2021.
- Copenhagen-Jerusalem Combinatorics Seminar, September 2021.
- Harvard University CMSA Interdisciplinary Science Seminar, September 2021.
- Members' Seminar, Harvard University CMSA, September 2021.
- Combinatorics Seminar, Hebrew University of Jerusalem, Israel, June 2021.
- Combinatorics Seminar, Bar-Ilan University, March 2021.
- Combinatorics Seminar, Georgia Tech, January 2021.
- Members' Seminar, Harvard University CMSA, October 2020.
- Combinatorics Seminar, Hebrew University of Jerusalem, Israel, December 2019.
- Combinatorics Seminar, Tel-Aviv University, December 2019.
- Combinatorics Seminar, Technion, December 2019.
- Random Structures and Algorithms Conference, Zurich, July 2019.
- Annual meeting of the Israel Mathematical Union, Jerusalem, June 2019.
- Combinatorics Seminar, Tel-Aviv University, November 2018.
- Combinatorics Seminar, Hebrew University of Jerusalem, Israel, November 2018.
- Combinatorics Seminar, Bar-Ilan University, November 2018.
- Combinatorics Seminar, University of Oxford, November 2018.
- Algorithms, Combinatorics, and Optimization Seminar, Carnegie Mellon University, October 2018.
- Discrete Mathematics Seminar, Princeton University, October 2018.
- Students Combinatorics Day, Bar Ilan University, July 2018.
- Geometric, Topological, and Computational Aspects of High Dimensional Expanders, Israel Institute of Advanced Study, March 2018.
- Combinatorics Seminar, Hebrew University of Jerusalem, Israel, May 2017.