

Vita

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- Research interests** Probabilistic and extremal combinatorics, random structures, and applications of combinatorics to theoretical computer science.
- Current position** CARNEGIE MELLON UNIVERSITY, Pittsburgh, Pennsylvania.
Associate Professor of Mathematics 2015–present; Assistant Professor 2010–2015.
- Professional activities** NATIONAL LEAD COACH, USA INTERNATIONAL MATH OLYMPIAD TEAM (2013–).
DEPUTY LEADER ('10–'13), INSTRUCTOR ('04, '08–'09) and ASSISTANT ('02, '03)
at the USA Math Olympiad Summer Program.
- Education** PRINCETON UNIVERSITY, Princeton, New Jersey.
Ph.D., Mathematics, Jan. 2010, advised by B. Sudakov.

CAMBRIDGE UNIVERSITY, Cambridge, United Kingdom.
Certificate of Advanced Study in Mathematics with Distinction, 2005.

CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena, California.
Bachelor of Science with Honor, Mathematics, 2004; GPA 4.3/4.3.
- Grants, fellowships, and awards** NSF CAREER Grant DMS-1455125, Extremal Combinatorics (2015–2020).
NSF Grant DMS-1201380, Extremal Combinatorics (2012–2015).
NSA Young Investigators Grant (2011–2012).
Co-PI, USA-Israel Binational Science Foundation Grant (2011–2015).
PI, NSF Infrastructure Grant for USA Math Olympiad Program (2010–2013).
Fannie and John Hertz Foundation Graduate Fellowship (2005–2010).
NSF Graduate Research Fellowship (2006–2009).
Winston Churchill Foundation Scholarship (2004–2005) for study at Cambridge.
16th and 18th places, 2002 and 2003 Putnam Mathematical Competitions.
7th place team (out of 3,150), 2004 ACM Int'l. Colleg. Programming Contest.
Silver medal, 1999 Int'l. Math Olympiad / 3rd place, 1996 Nat'l. MathCounts.
Nat'l Olympiad training camp qual. in 3 subjects (math, computing, chemistry).
- Publications** *Directed paths: from Ramsey to Ruzsa and Szemerédi*
(single author), submitted.

Cops and robbers on planar directed graphs
(with S. Oh), submitted.

- Publ. (ctd.)** *Diameter critical graphs*
(with J. Ma), J. Combin. Theory Ser. B, to appear.
- Hamiltonian increasing paths in random edge orderings*
(with M. Lavrov), Rand. Struct. Algo., to appear.
- Judicious partitions of directed graphs*
(with C. Lee and B. Sudakov), Rand. Struct. Algo., to appear.
- Maximizing the number of independent sets of a fixed size*
(with W. Gan and B. Sudakov), Combin. Probab. Comput., to appear.
- The critical window for the classical Ramsey-Turán problem*
(with J. Fox and Y. Zhao), Combinatorica, to appear.
- Anarchy is free in network creation*
(with R. Graham, L. Hamilton, and A. Levavi), Transactions on Algorithms, to appear.
- The Probabilistic Method*
(book chapter, with A. Frieze), in: Handbook of Graph Theory, to appear.
- Computing with voting trees*
(with J. Iglesias and N. Ince), SIAM J. Discrete Math **28** (2014), 673–684.
- Thresholds for extreme orientability*
(with R. Pagh), Algorithmica **69** (2014), 522–539.
- Packing tree factors in random and pseudo-random graphs*
(with D. Bal, A. Frieze, and M. Krivelevich), Electron. J. Combin. **21** (2014), P2.8
- Rainbow Hamilton cycles in random graphs*
(with A. Frieze), Rand. Struct. Algo. **44** (2014), 328–354.
- Anarchy is free in network creation*
(with R. Graham, L. Hamilton, and A. Levavi), Proc. 10th Workshop on Algorithms and Models for the Web Graph, LNCS **8305** (2013), 220–231.
- Bisections of graphs*
(with C. Lee and B. Sudakov), J. Combin. Theory Ser. B **103** (2013), 599–629.
- Self-similarity of graphs*
(with C. Lee and B. Sudakov), SIAM J. Discrete Math **27** (2013), 959–972.
- Stochastic coalescence in logarithmic time*
(with E. Lubetzky), Ann. Appl. Probab. **23** (2013), 492–528.

- Publ. (ctd.)** *On a problem of Erdős and Rothschild on edges in triangles*
(with J. Fox), *Combinatorica* **32** (2012), 619–628.
- Optimal divisibility conditions for loose Hamilton cycles in random hypergraphs*
(with A. Dudek, A. Frieze, and S. Speiss), *Electron. J. Combin.* **19** (2012), P44.
- Packing tight Hamilton cycles in 3-uniform hypergraphs*
(with A. Frieze and M. Krivelevich), *Rand. Struct. Algo.*, **40** (2012), 269–300.
- The size of a hypergraph and its matching number*
(with H. Huang and B. Sudakov), *Combin. Probab. Comput.*, **21** (2012), 442–450.
- Variations on Cops and Robbers*
(with A. Frieze and M. Krivelevich), *J. Graph Theory*, **69** (2012), 383–402.
- Stochastic coalescence in logarithmic time*
(with E. Lubetzky), *Proceedings of the Twenty-Third Annual ACM-SIAM Symposium on Discrete Algorithms* (2012), 541–550.
- Packing tight Hamilton cycles in 3-uniform hypergraphs*
(with A. Frieze and M. Krivelevich), *Proceedings of the Twenty-Second Annual ACM-SIAM Symposium on Discrete Algorithms* (2011), 913–932.
- Ramsey games with giants*
(with T. Bohman, A. Frieze, M. Krivelevich, and B. Sudakov), *Rand. Struct. Algo.* **38** (2011), 1–32.
- Maximizing the number of q -colorings*
(with O. Pikhurko and B. Sudakov), *Proc. Lond. Math. Soc.* **101** (2010), 655–696.
- A note on embedding hypertrees*
(single author), *Electron. J. Combin.* **16** (2009), N18.
- Constrained Ramsey Numbers*
(with B. Sudakov), *Combin. Probab. Comput.* **18** (2009), 247–258.
- Large induced trees in K_r -free graphs*
(with J. Fox and B. Sudakov), *J. Combin. Theory Ser. B* **99** (2009), 494–501.
- Avoiding small subgraphs in Achlioptas processes*
(with M. Krivelevich and B. Sudakov), *Rand. Struct. Algo.* **34** (2009), 165–195.
- On the strong chromatic number of random graphs*
(with B. Sudakov), *Combin. Probab. Comput.* **17** (2008), 271–286.

- Publ. (ctd.)** *Independent transversals in locally sparse graphs*
(with B. Sudakov), J. Combin. Theory Ser. B **97** (2007), 904–918.
- Bounding the number of edges in permutation graphs*
(with P. Keevash and B. Sudakov), Electron. J. Combin. **13** (2006), R44.
- USA and International Mathematical Olympiads 2004*
(book, co-edited with T. Andreescu and Z. Feng),
published by the Mathematical Association of America (2005), 100pp.
- Improved expansion of random Cayley graphs*
(with L. Schulman), Discrete Math. Theor. Comput. Sci. **6** (2004), 523–528.
- Finding shortest paths with computational geometry*
(single author), J. Graph Algorithms Appl. **7** (2003), 287–303.

Talks

- AMS Spring Western Sectional Meeting, University of Utah, Salt Lake City. (2016)
- Math Department Colloquium, Stanford University. (2016)
- AMS Special Session on Pseudorandomness and Its Applications, Joint Math Meetings, Seattle. (2016)
- Combinatorics Seminar, Tel Aviv University. (2015)
- AMS Central Fall Sectional Meeting, Loyola University, Chicago. (2015)
- Featured Speaker, Annual Mathematics Conference, Miami University. (2015)
- Workshop on Extremal and Probabilistic Combinatorics, University of Birmingham, United Kingdom. (2015)
- Workshop on methods and challenges in extremal and probabilistic combinatorics, Banff, Canada. (2015)
- Mini-Workshop on Extremal Combinatorics, University of Science and Technology of China, Hefei. (2015)
- Minisymposium on Extremal Combinatorics, International Congress on Industrial and Applied Mathematics, Beijing. (2015)
- Conference on random structures and algorithms, Carnegie Mellon University. (2015)
- Connections in Discrete Mathematics (conference celebrating Ron Graham), Simon Fraser University. (2015)
- AMS Spring Western Sectional Meeting, University of Nevada, Las Vegas. (2015)
- Discrete Math Day of the Northeast, Bard College. (2015)
- AMS Central Spring Sectional Meeting, Michigan State University. (2015)

Talks (ctd.) Colloquium, University of San Francisco. (2015)

ICM 2014 Satellite Conference on Extremal and Structural Graph Theory, Gyeongju, Korea. (2014)

Clay workshop on extremal and probabilistic combinatorics, Oxford. (2014)

Cumberland conference on graph theory, combinatorics, and computing, West Virginia University. (2014)

Combinatorics seminar, University of California Los Angeles. (2014)

Erdős lecture series, University of Memphis. (2014)

New York combinatorics seminar, CUNY Graduate Center. (2014)

Combinatorics seminar, University of Delaware. (2014)

Workshop on combinatorics, Oberwolfach, Germany. (2014)

Combinatorics seminar, Tel Aviv University. (2013)

Special session on Extremal Graph Theory, AMS Southeastern Sectional Meeting, University of Louisville. (2013)

Mittagseminar, Institute of Theoretical Computer Science, ETH Zürich. (2013)

Conference on random structures and algorithms, Poznań, Poland. (2013)

Combinatorial theory seminar, Oxford University. (2013)

Combinatorics seminar, University of California Los Angeles. (2013)

Combinatorics seminar, California Institute of Technology. (2013)

Special session on Extremal Combinatorics, AMS Central Sectional Meeting, Iowa State University. (2013)

Atlanta Lecture Series in combinatorics and graph theory, Atlanta, GA. (2013)

Workshop on extremal and probabilistic combinatorics, UCLA. (2013)

Discrete math seminar, Korea Advanced Institute of Science and Technology. (2013)

Combinatorics seminar, Tel Aviv University. (2012)

Combinatorics seminar, Massachusetts Institute of Technology. (2012)

Algorithms, combinatorics, and optimization seminar, Carnegie Mellon University. (2012)

Workshop on new trends and directions in combinatorics, Banff, Canada. (2012)

SIAM conference on Discrete Mathematics, Halifax, Canada. (2012)

Talks (ctd.) Workshop on hypergraph Turán problems, Oberwolfach, Germany. (2012)
WilsonFest (Combinatorics), Caltech. (2012)
Combinatorics seminar, Georgia Tech. (2012)
Combinatorics and probability seminar, University of Pennsylvania. (2012)
ACM-SIAM Symposium on Discrete Algorithms, Kyoto, Japan. (2012)
Mini-symposium on Probabilistic Combinatorics, AMS-MAA-SIAM Joint Mathematics Meetings, Boston. (2012)
Combinatorics seminar, The Hebrew University of Jerusalem. (2011)
Combinatorics seminar, Tel Aviv University. (2011)
Combinatorics seminar, University of California Los Angeles. (2011)
Combinatorics seminar, California Institute of Technology. (2011)
Special session on Extremal Combinatorics, AMS Southeastern Sectional Meeting, Wake Forest University. (2011)
Colloquium, Georgia State University. (2011)
Workshop on graph limits, American Institute of Mathematics, Palo Alto. (2011)
Workshop on randomized and approximation algorithms, Dagstuhl, Germany. (2011)
Probability seminar, University of Cambridge. (2011)
Mini-symposium on probabilistic Combinatorics, Canadian Discrete and Algorithmic Mathematics Conference, Victoria, Canada. (2011)
Conference on random structures and algorithms, Atlanta, Georgia. (2011)
Computer Science theory seminar, California Institute of Technology. (2011)
Combinatorics seminar, University of California Los Angeles. (2011)
Combinatorics seminar, Massachusetts Institute of Technology. (2011)
ACM-SIAM Symposium on Discrete Algorithms, San Francisco. (2011)
Workshop on Combinatorics, Oberwolfach, Germany. (2011)
Mathematics colloquium, Dartmouth College. (2010)
Computer Science theory seminar, Carnegie Mellon University. (2010)
Combinatorics seminar, University of California Los Angeles. (2010)
Combinatorics seminar, California Institute of Technology. (2010)

Talks (ctd.) SIAM conference on Discrete Mathematics, Austin, TX. (2010)
Combinatorics seminar, Tel Aviv University. (2010)
Specialized session in Combinatorics, Israeli Mathematical Union Annual Meeting, Weizmann Institute, Israel. (2010)
Combinatorics seminar, Institute of Pure and Applied Mathematics, Los Angeles. (2009)
Workshop on graphs and hypergraphs, Institute of Pure and Applied Mathematics, Los Angeles. (2009)
Workshop on probabilistic and extremal Combinatorics, Banff. (2009)
Conference on random structures and algorithms, Poznań, Poland. (2009)
Workshop on Combinatorics, randomization, algorithms, and probability, Centre de Recherches Mathématiques, Montreal. (2009)
Combinatorics seminar, California Institute of Technology. (2009)
Special session on probabilistic and extremal Combinatorics, AMS Central Sectional Meeting, Urbana, IL. (2009)
Discrete math seminar, Princeton University. (2009)
Discrete math seminar, Columbia University. (2009)
Geometry seminar, New York University. (2009)
Combinatorics seminar, Rutgers University. (2009)
Combinatorics seminar, University of California Los Angeles. (2009)
Mathematical Sciences colloquium, Carnegie Mellon University. (2009)
Probability seminar, University of Southern California. (2009)
Algorithms, combinatorics, and optimization seminar, Carnegie Mellon University. (2009)
SIAM conference on Discrete Mathematics, Burlington, VT. (2008)
Computer Science theory seminar, California Institute of Technology. (2008)
Combinatorics seminar, University of California San Diego. (2008)
Probability seminar, University of California Los Angeles. (2008)
Combinatorics seminar, California Institute of Technology. (2008)
Combinatorics seminar, City University of New York. (2007)

- Talks (ctd.)** European conference in Combinatorics, graph theory, and applications, Seville, Spain. (2007)
- Combinatorics seminar, California Institute of Technology. (2007)
- Combinatorics seminar, University of California San Diego. (2007)
- Workshop on extremal graphs and hypergraphs, Carnegie Mellon University. (2007)
- Combinatorics seminar, University of Pennsylvania. (2006)
- Computer Science / discrete math seminar, Inst. for Advanced Study. (2006)
- Combinatorics seminar, Rutgers University. (2006)
- Combinatorics seminar, City University of New York. (2006)
- Combinatorics seminar, California Institute of Technology. (2006)
- Workshop on algebraic and geometric methods in Combinatorics, DIMACS, Rutgers University. (2005)
- Morgan Prize honorable mention lecture, AMS-MAA-SIAM Joint Meetings, Atlanta, GA. (2005)
- Talks (gen.)** Public lecture at National Museum of Mathematics, New York City. (2015)
- Colloquium, Canada/USA MathCamp. (2015)
- Public lecture for Proof School, San Francisco, CA. (2015)
- Colloquium, Canada/USA MathCamp. (2014)
- Lecture on connections between 2014 IMO Problem #6 and Probabilistic Combinatorics research, International Math Olympiad, South Africa. (2014)
- Colloquium, Canada/USA MathCamp. (2013)
- Korean Math Olympiad Winter School, Daejeon, South Korea. (2013)
- Assembly, Shady Side Academy, Pittsburgh, PA. (2012)
- Keynote, Mellon College of Science honors convocation, Carnegie Mellon University commencement weekend. (2012)
- Public lecture on math competitions, Atlanta, GA. (2011)
- Colloquium, Canada/USA MathCamp. (2011)
- Assembly, Phillips Exeter Academy, Exeter, NH. (2010)
- Colloquium, Canada/USA MathCamp. (2010)
- Colloquium, Canada/USA MathCamp. (2009)

Talks (gen.) Invited talk showcasing the Fall 2009 IPAM Program on Combinatorics, SACNAS (Society for Advancement of Chicanos and Native Americans in Science) National Conference, Salt Lake City, UT. (2008)