# Yufei Zhao

http://yufeizhao.com
yufeiz@mit.edu
MIT Department of Mathematics
77 Massachusetts Ave, Room 2-271
Cambridge, MA 02139, USA

**Department of Mathematics, Massachusetts Institute of Technology** — Cambridge, MA
- Associate Professor — 2022—
- Class of 1956 Career Development Assistant Professor — 2018—2021
- Assistant Professor — 2017—2022

## Previous and Visiting Academic Positions

**Department of Mathematics, Stanford University** — Stanford, CA
- Visiting Assistant Professor — Spring 2020

**Simons Institute for the Theory of Computing, UC Berkeley** — Berkeley, CA
- Simons-Berkeley Research Fellow — Spring 2017

**New College, University of Oxford** — Oxford, UK
- Esmée Fairbairn Junior Research Fellow in Mathematics — 2015—2017

## Education

**Massachusetts Institute of Technology** — Cambridge, MA
- Ph.D. Mathematics. Advisor: Jacob Fox — 2011—2015

**University of Cambridge** — Cambridge, UK
- M.A.St. Mathematics with Distinction — 2010—2011

**Massachusetts Institute of Technology** — Cambridge, MA
- S.B. Mathematics, with minor in Economics — 2006—2010
- S.B. Computer Science and Engineering

## Selected Awards and Honors

Edmund F. Kelly Research Award, MIT Mathematics, 2022

**NSF CAREER Award**, 2021

UROP Outstanding Mentor Award for Faculty, MIT, 2020

First Year Advisor Award—Innovative Seminar, MIT, 2019

**Sloan Research Fellowship**, 2019

Future of Science Award, MIT, 2018

**SIAM Dénes König Prize**, 2018

Johnson Prize, MIT Mathematics, 2015

Microsoft Research PhD Fellowship, 2013–2015

Morgan Prize Honorable Mention, 2011

Gates Cambridge Scholarship, 2010–2011

Jon A. Bucsela Prize in Mathematics, MIT Mathematics, 2010

Putnam Math Competition: Three-time Putnam Fellow (top five rank) 2006, 2008, 2009; 7th Place 2007

International Mathematical Olympiad: Gold Medal 2005, Silver Medal 2006, Bronze Medal 2004

## Research Interests

Combinatorics
extremal, probabilistic, and additive combinatorics;
graph theory; discrete geometry; applications to computer science

## Grants

NSF CAREER award DMS-2044606 2021—2026

Sloan Research Fellowship 2019—2021

MIT Solomon Buchsbaum Research Fund 2018

NSF award DMS-1764176 2018—2021

NSF award DMS-1362326 2017—2018

## Research Internships

Microsoft Research New England Cambridge, MA
Mentor: Henry Cohn Summers 2010, 2011, 2013, 2014

Microsoft Research Theory Group Redmond, WA
Mentor: Eyal Lubetzky Summer 2012

## Book

Yufei Zhao, *Graph Theory and Additive Combinatorics—Exploring Structure and Randomness*
Cambridge University Press, 2023. xvii+316 pp. https://yufeizhao.com/gtacbook/

## Papers

66. David Conlon, Jacob Fox, Huy Tuan Pham, and Yufei Zhao
Set-coloring Ramsey numbers and error-correcting codes near the zero-rate threshold. arXiv:2305.14132
65. József Balogh, Dingding Dong, Bernard Lidický, Nitya Mani, and Yufei Zhao
Nearly all $k$-SAT functions are unate.
*ACM Symposium on Theory of Computing (STOC 2023)* arXiv:2209.04894
64. Assaf Naor, Ashwin Sah, Mehtaab Sawhney, and Yufei Zhao
Cayley graphs that have a quantum ergodic eigenbasis,
*Israel J. Math.*, to appear. arXiv:2207.05527
63. Dingding Dong, Nitya Mani, and Yufei Zhao
On the number of error correcting codes.
*Combin. Probab. Comput.*, to appear. arXiv:2205.12363
62. Michael Magee, Joe Thomas, and Yufei Zhao
Quantum Unique Ergodicity for Cayley graphs of quasirandom groups,
*Comm. Math. Phys.*, to appear. arXiv:2204.10642
61. Yufei Zhao, Exploring a planet, revisited,
*Amer. Math. Monthly* 129 (2022), 678–680. arXiv:2110.04376
60. Milan Haiman, Carl Schildkraut, Shengtong Zhang, and Yufei Zhao,
Graphs with high second eigenvalue multiplicity,
*Bull. Lond. Math. Soc.* 54 (2022), 1630–1652. arXiv:2109.13131

59. Dingding Dong, Nitya Mani, and Yufei Zhao
Enumerating $k$-SAT functions,
*ACM-SIAM Symposium on Discrete Algorithms (SODA 2022)*. arXiv:2107.09233

58. David Conlon, Jacob Fox, Benny Sudakov, and Yufei Zhao,
Which graphs can be counted in $C_4$-free graphs?
*Pure Appl. Math. Q.* 18 (2022), 2413–2432. arXiv:2106.03261

57. Jacob Fox and Yufei Zhao,
Removal lemmas and approximate homomorphisms,
*Combin. Probab. Comput.*, to appear. arXiv:2104.11626

56. Aaron Berger and Yufei Zhao,
$K_4$-intersecting families of graphs. arXiv:2103.12671

55. Ashwin Sah, Mehtaab Sawhney, Yufei Zhao,
The cylindrical width of transitive sets,
*Israel J. Math.*, 253 (2023), 647–672. arXiv:2101.11207

54. Ashwin Sah, Mehtaab Sawhney, Yufei Zhao,
Paths of given length in tournaments,
*Comb. Theory*, to appear. arXiv:2012.00262

53. Jonathan Tidor, Hung-Hsun Hans Yu, and Yufei Zhao,
Joints of varieties,
*Geom. Funct. Anal.* 32 (2022) 302–339. arXiv:2008.01610

52. Matthew Kwan, Lisa Sauermann, and Yufei Zhao,
Extension complexity of low-dimensional polytopes,
*Trans. Amer. Math. Soc.* 375 (2022), 4209–4250. arXiv:2006.08836

51. Zilin Jiang, Jonathan Tidor, Yuan Yao, Shengtong Zhang, and Yufei Zhao,
Spherical two-distance sets and eigenvalues of signed graphs,
*Combinatorica*, to appear. arXiv:2006.06633

50. Ashwin Sah, Mehtaab Sawhney, and Yufei Zhao,
Cayley graphs without a bounded eigenbasis,
*Int. Math. Res. Not. IMRN* 2022 (2022), 6157–6185. arXiv:2005.04502

49. Jacob Fox, Yuval Wigderson, and Yufei Zhao,
A short proof of the canonical polynomial van der Waerden theorem,
*C. R. Math. Acad. Sci. Paris* 358 (2020), 957–959. arXiv:2005.04135

48. Jacob Fox, Huy Tuan Pham, and Yufei Zhao,
Tower-type bounds for Roth's theorem with popular differences.
*J. Eur. Math. Soc. (JEMS)*, to appear. arXiv:2004.13690

47. David Conlon, Jacob Fox, Benny Sudakov, and Yufei Zhao,
The regularity method for graphs with few 4-cycles,
*J. Lond. Math. Soc.* 104 (2021), 2376–2401. arXiv:2004.10180

46. Ashwin Sah, Mehtaab Sawhney, and Yufei Zhao,
Patterns without a popular difference,
*Discrete Anal.*, 2021:8, 30 pp. arXiv:2004.07722

45. Ashwin Sah, Mehtaab Sawhney, Jonathan Tidor, and Yufei Zhao,
A counterexample to the Bollobás-Riordan conjectures on sparse graph limits,
*Combin. Probab. Comput.* 30 (2021), 796–799. arXiv:2003.05272

44. Hung-Hsun Hans Yu and Yufei Zhao,
Joints tightened,
*Amer. J. Math.*, to appear. arXiv:1911.08605

43. Jonathan Tidor and Yufei Zhao,
Testing linear-invariant properties,
*IEEE Symposium on Foundations of Computer Science (FOCS 2020)*, and
*SIAM J. Comput.* 51 (2022), 1230–1279. arXiv:1911.06793

42. Jacob Fox, Jonathan Tidor, and Yufei Zhao,
Induced arithmetic removal: complexity 1 patterns over finite fields,
*Israel J. Math.* 248 (2022), 1–38. arXiv:1911.03427

41. Jacob Fox, Huy Tuan Pham, and Yufei Zhao,
Common and Sidorenko linear equations,
*Q. J. Math.* 72 (2021), 1223–1234. arXiv:1910.06436

40. Yang Liu and Yufei Zhao,
On the upper tail problem for random hypergraphs,
*Random Structures Algorithms* 58 (2021), 179–220. arXiv:1910.02916

39. Zilin Jiang, Jonathan Tidor, Yuan Yao, Shengtong Zhang, and Yufei Zhao,
Equiangular lines with a fixed angle,
*Ann. of Math.* 194 (2021), 729–743. arXiv:1907.12466

38. Yufei Zhao and Yunkun Zhou,
Impartial digraphs,
*Combinatorica* 40 (2020), 875–896. arXiv:1906.10482

37. Ashwin Sah, Mehtaab Sawhney, David Stoner, and Yufei Zhao,
Exponential improvements for superball packing upper bounds,
*Adv. Math.* 365 (2020), 107056. arXiv:1904.11462

36. Jacob Fox, Ashwin Sah, Mehtaab Sawhney, David Stoner, and Yufei Zhao,
Triforce and corners,
*Math. Proc. Cambridge Philos. Soc.* 169 (2020), 209–223. arXiv:1903.04863

35. Ashwin Sah, Mehtaab Sawhney, David Stoner, and Yufei Zhao,
A reverse Sidorenko inequality,
*Invent. Math.* 221 (2020), 665–711. arXiv:1809.09462

34. David Conlon, Jonathan Tidor, and Yufei Zhao,
Hypergraph expanders of all uniformities from Cayley graphs,
*Proc. Lond. Math. Soc.* 121 (2020), 1311–1336. arXiv:1809.06342

33. Asaf Ferber, Vishesh Jain, and Yufei Zhao,
On the number of Hadamard matrices via anti-concentration,
*Combin. Probab. Comput.* 31 (2022), 455–477. arXiv:1808.07222

32. Ashwin Sah, Mehtaab Sawhney, David Stoner, and Yufei Zhao,
The number of independent sets in an irregular graph,
*J. Combin. Theory Ser. B* 138 (2019), 172–195. arXiv:1805.04021.

31. Jacob Fox, László Miklós Lovász, and Yufei Zhao,
A fast new algorithm for weak graph regularity,
*Combin. Probab. Comput.* 28 (2019), 777–790. arXiv:1801.05037

30. Noga Alon, Jacob Fox, and Yufei Zhao,
Efficient arithmetic regularity and removal lemmas for induced bipartite patterns,
*Discrete Anal.* 2019:3, 14 pp. arXiv:1801.04675

29. Yufei Zhao, Group representations that resist worst-case sampling. arXiv:1705.04675
28. Yufei Zhao, Extremal regular graphs: independent sets and graph homomorphisms, *Amer. Math. Monthly* 124 (2017), 827–843. arXiv:1610.09210
27. Bhaswar B. Bhattacharya, Shirshendu Ganguly, Xuancheng Shao, and Yufei Zhao, Upper tails for arithmetic progressions in a random set, *Int. Math. Res. Not. IMRN* 2020, 167–213. arXiv:1605.02994
26. Jacob Fox, László Miklós Lovász, and Yufei Zhao, On regularity lemmas and their algorithmic applications, *Combin. Probab. Comput.* 26 (2017), 481–505. arXiv:1604.00733
25. David Conlon and Yufei Zhao, Quasirandom Cayley graphs, *Discrete Anal.* 2017:6, 14 pp. arXiv:1603.03025
24. Bhaswar B. Bhattacharya, Shirshendu Ganguly, Eyal Lubetzky, and Yufei Zhao, Upper tails and independence polynomials in random graphs, *Adv. Math.* 319 (2017), 313–347. arXiv:1507.04074
23. László Miklós Lovász and Yufei Zhao, On derivatives of graphon parameters, *J. Combin. Theory Ser. A* 145 (2017), 364–368. arXiv:1505.07448
22. Yufei Zhao, On the lower tail variational problem for random graphs, *Combin. Probab. Comput.* 26 (2017), 301–320. arXiv:1502.00867
21. Christian Borgs, Jennifer T. Chayes, Henry Cohn, and Yufei Zhao, An $L^p$ theory of sparse graph convergence II: LD convergence, quotients, and right convergence, *Ann. Probab.* 46 (2018), 337–396. arXiv:1408.0744
20. David Conlon, Jacob Fox, and Yufei Zhao, The Green-Tao theorem: an exposition, *EMS Surv. Math. Sci.* 1 (2014), 249–282. arXiv:1403.2957
19. Eyal Lubetzky and Yufei Zhao, On the variational problem for upper tails in sparse random graphs, *Random Structures Algorithms* 50 (2017), 420–436. arXiv:1402.6011
18. Christian Borgs, Jennifer T. Chayes, Henry Cohn, and Yufei Zhao, An $L^p$ theory of sparse graph convergence I: limits, sparse random graph models, and power law distributions, *Trans. Amer. Math. Soc.* 372 (2019), 3019–3062. arXiv:1401.2906
17. Yufei Zhao, An arithmetic transference proof of a relative Szemerédi theorem, *Math. Proc. Cambridge Philos. Soc.* 156 (2014), 255–261. arXiv:1307.4959
16. Jacob Fox and Yufei Zhao, A short proof of the multidimensional Szemerédi theorem in the primes, *Amer. J. Math.* 137 (2015), 1139–1145. arXiv:1307.4679
15. David Conlon, Jacob Fox, and Yufei Zhao, A relative Szemerédi theorem, *Geom. Funct. Anal.* 25 (2015), 733–762. arXiv:1305.5440
14. Yufei Zhao, Hypergraph limits: a regularity approach, *Random Structures Algorithms* 47 (2015), 205–226. arXiv:1302.1634
13. Henry Cohn and Yufei Zhao, Sphere packing bounds via spherical codes, *Duke Math. J.* 163 (2014), 1965–2002. arXiv:1212.5966

12. Henry Cohn and Yufei Zhao,
Universally optimal error-correcting codes,
*IEEE Trans. Inform. Theory* 60 (2014), 7442–7450. arXiv:1212.1913
11. Eyal Lubetzky and Yufei Zhao,
On replica symmetry of large deviations in random graphs,
*Random Structures Algorithms* 47 (2015) 109–146. arXiv:1210.7013
10. Jacob Fox, Po-Shen Loh, and Yufei Zhao,
The critical window for the classical Ramsey-Turán problem,
*Combinatorica* 35 (2015) 435–476. arXiv:1208.3276
9. David Conlon, Jacob Fox, and Yufei Zhao,
Extremal results in sparse pseudorandom graphs,
*Adv. Math.* 256 (2014), 206–290. arXiv:1204.6645
8. Yufei Zhao, The bipartite swapping trick on graph homomorphisms,
*SIAM J. Discrete Math.* 25 (2011), 660–680. arXiv:1104.3704
7. Yufei Zhao, Sets characterized by the number of missing sums and differences,
*J. Number Theory* 11 (2011), 2107–2134. arXiv:0911.2292
6. David Galvin and Yufei Zhao,
The number of independent sets in graphs with small maximum degree,
*Graphs Combin.* 27 (2011), 177–186. arXiv:1007.4803
5. Yufei Zhao, Counting MSTD sets in finite abelian groups,
*J. Number Theory* 130 (2010), 2308–2322. arXiv:0911.2288
4. Yufei Zhao, Constructing numerical semigroups of a given genus,
*Semigroup Forum* 80 (2010), 242–254. arXiv:0910.2075
3. Yufei Zhao, Constructing MSTD sets using bidirectonal ballot sequences,
*J. Number Theory* 130 (2010), 1212–1220. arXiv:0908.4442
2. Yufei Zhao, The number of independent sets in a regular graph,
*Combin. Probab. Comput.* 19 (2010), 315–320. arXiv:0909.3354
1. Yufei Zhao, The coefficients of a truncated Fibonacci power series,
*Fibonacci Quart.* 46/47 (2009), 53–55.

## Invited Talks

*Selected talk videos and slides can be found on my homepage:* `https://yufeizhao.com`

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|---|---|---|
| 2023 | GallianFest: Number Theory and Combinatorics in Duluth | Duluth, MN |
| | Sphere packings, coverings, and spherical codes (SPCSC2023) | Sofia, Bulgaria |
| | Cumberland Conference: Plenary Speaker | Murfreesboro, TN |
| | IAS Special Year Seminar | Princeton, NJ |
| | Oberwolfach workshop: Combinatorics | Oberwolfach, Germany |
| 2022 | TILOS and OPTML++ Seminar | Online |
| | U. Washington-PIMS Mathematics Colloquium | Seattle, WA |
| | TU Graz Combinatorics Seminar | Online |
| | Waterloo Algebraic Graph Theory seminar | Online |
| | Conference on Random Structures & Algorithms (RS&A): **Plenary Speaker** | Gniezno, Poland |
| | International Congress of Chinese Mathematicians (ICCM): **Plenary Speaker** | Nanjing, China/Online |

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| | Shandong University Mathematics seminar | Online |
| | Workshop on Critical and Collective Effects in Graphs and Networks (CCEGN-V) | Falmouth, MA |
| | Oberwolfach workshop: Combinatorics, Probability and Computing | Oberwolfach, Germany |
| | U. of Chicago Mathematics Colloquium | Chicago, IL |
| | U. of Chicago Combinatorics and Theoretical Computer Science Seminar | Chicago, IL |
| | Johns Hopkins Applied Mathematics and Statistics Colloquium | Online |
| | Vrije Universiteit in Amsterdam General Mathematics Colloquium | Online |
| 2021 | AIM workshop on Spectral graph and hypergraph theory: connections and applications | Online |
| | Ohio State University Mathematics Colloquium | Columbus, OH |
| | Ohio State University Combinatorics & Probability Seminar | Columbus, OH |
| | National University of Singapore (NUS) Young Mathematician Lecture Series | Online |
| | Canadian Discrete and Algorithmic Math Conference (CanaDAM): **Plenary Lecture** | Online |
| | Workshop on Extremal and Algorithmic Aspects of Partition Functions | Online |
| | Copenhagen–Jerusalem Combinatorics Seminar | Online |
| | Simons Collaboration: Algorithms & Geometry Monthly Meeting | Online |
| | Caltech/UCLA Joint Analysis Seminar | Online |
| | Joint Math Meetings MAA Invited Paper Session “Coding Theory and Geometry” | Online |
| 2020 | Warwick Centre for Discrete Mathematics and its Applications seminar | Online |
| | Virtual Harmonic Analysis Seminar | Online |
| | University of Wisconsin Number Theory / Representation Theory Seminar | Online |
| | Princeton Discrete Mathematics Seminar | Online |
| | Big Seminar by Laboratory of Combinatorial and Geometric Structures | Online |
| | SCMS Combinatorics Seminar | Online |
| | Cumberland Conference Plenary speaker (Canceled due to COVID-19) | Williamsburg, VA |
| | Simons Collaboration: Algorithms & Geometry Annual Conference Plenary Lecture (Canceled due to COVID-19) | New York, NY |
| | Webinar in Additive Combinatorics | Online |
| | Stanford Online Combinatorics Seminar | Online |
| | Stanford Math Department Colloquium | Stanford, CA |
| | Oberwolfach workshop: Combinatorics | Oberwolfach, Germany |
| 2019 | Shanghai Center for Mathematical Sciences (Fudan) Discrete Math. Seminar | Shanghai, China |
| | Conference on Graph Theory and its Applications: A Tribute to Prof. Fan Chung | Sanya, China |
| | Atlanta Lectures Series in Combinatorics and Graph Theory at Emory | Atlanta, GA |
| | Princeton Discrete Mathematics Seminar | Princeton, NJ |
| | Banff workshop: Probabilistic and Extremal Combinatorics | Banff, AB |
| | ETH Zurich Theory of Combinatorial Algorithms Mittagsseminar | Zürich, Switzerland |
| | Oberwolfach workshop: Combinatorics, Probability and Computing | Oberwolfach, Germany |

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| | Rutgers Discrete Math Seminar | Piscataway, NJ |
| | Yale Combinatorics Seminar | New Haven, CT |
| | Stanford Combinatorics Seminar | Stanford, CA |
| 2018 | Clay Math Institute workshop: Recent Advances in Extremal Combinatorics | Oxford, UK |
| | ICM satellite workshop — Combinatorics: Extremal, Probabilistic and Additive | São Paulo, Brazil |
| | Simons Institute workshop: Pseudorandomness Reunion | Berkeley, CA |
| | MIT Workshop on Local Algorithms (WOLA 2018) | Cambridge, MA |
| | MIT workshop on Sublinear Algorithms: bootcamp tutorial | Cambridge, MA |
| | SIAM Conference on Discrete Mathematics: minisymposium | Denver, CO |
| | SIAM Conference on Discrete Mathematics: Dénes König Prize Lecture | Denver, CO |
| | Georgia Tech workshop: Algorithms and Randomness | Atlanta, GA |
| | Northeastern U. Network Science Institute Talk | Boston, MA |
| | AMS Sectional Meeting at Northeastern University | Boston, MA |
| | Rutgers Discrete Math Seminar | Piscataway, NJ |
| | Tsinghua YMSC minicourse | Beijing, China |
| | CMU ACO Seminar | Pittsburgh, PA |
| | Harvard CMSA workshop: Probabilistic and Extremal Combinatorics | Cambridge, MA |
| | UCLA Combinatorics Seminar | Los Angeles, CA |
| 2017 | Harvard CMSA workshop: Additive Combinatorics | Cambridge, MA |
| | Birmingham workshop: Interactions with Combinatorics | Birmingham, UK |
| | BGSMath workshop: Random Discrete Structures and Beyond | Barcelona, Spain |
| | SFSU: ACG Seminar | San Francisco, CA |
| | Stanford Math Department Colloquium | Stanford, CA |
| | Simons Institute workshop: Structure and Randomness | Berkeley, CA |
| | MIT Combinatorics Seminar | Cambridge, MA |
| | UC Berkeley Combinatorics Seminar | Berkeley, CA |
| | Simons Institute workshop: Pseudorandomness Boot Camp | Berkeley, CA |
| | Stanford Combinatorics Seminar | Stanford, CA |
| | Oberwolfach workshop: Combinatorics | Oberwolfach, Germany |
| 2016 | Turing Institute workshop: Large-scale structures in random graphs | London, UK |
| | Birmingham Combinatorics Seminar | Birmingham, UK |
| | IHÉS Seminar | Bures-sur-Yvette, France |
| | Warwick DIMAP Seminar | Coventry, UK |
| | LSE/Queen Mary Colloquia in Combinatorics | London, UK |
| | Oberwolfach workshop: Combinatorics, Probability and Computing | Oberwolfach, Germany |
| | Simons Symposium: Analysis of Boolean Functions | Krün, Germany |
| | British Mathematical Colloquium: Combinatorics Workshop | Bristol, UK |

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| | Oxford Mathematical Institute North meets South Colloquium | Oxford, UK |
| | AMS-MAA Joint Mtgs: AMS Spec. Session on Pseudorandomness and Its Applications | Seattle, WA |
| 2015 | London School of Economics Discrete Mathematics and Game Theory Seminar | London, UK |
| | Queen Mary Combinatorics Seminar | London, UK |
| | Warwick Combinatorics Seminar | Coventry, UK |
| | Oxford Combinatorial Theory Seminar | Oxford, UK |
| | Northeastern U. workshop: Random Graphs, Simplicial Complexes, and their Appl'ns | Boston, MA |
| | U. of Chicago Combinatorics and Theoretical Computer Science Seminar | Chicago, IL |
| | Rutgers Discrete Math Seminar | Piscataway, NJ |
| | ICERM workshop: Crystals, Quasicrystals and Random Networks | Providence, RI |
| 2014 | Atlanta Lectures Series in Combinatorics and Graph Theory at Emory | Atlanta, GA |
| | GSU Colloquium | Atlanta, GA |
| | CRM workshop: New Topics in Additive Combinatorics | Montreal, QC |
| | IMA workshop: Additive and Analytic Combinatorics | Minneapolis, MN |
| | Clay Math Institute workshop: Extremal and Probabilistic Combinatorics | Oxford, UK |
| | Georgia Tech Combinatorics Seminar | Atlanta, GA |
| | IAS Computer Science/Discrete Mathematics Seminar | Princeton, NJ |
| | Oxford Combinatorial Theory Seminar | Oxford, UK |
| | London School of Economics Discrete Mathematics and Game Theory Seminar | London, UK |
| | Eurandom: Minicourse on Graph Limits (6-hour minicourse co-taught with Christian Borgs) | Eindhoven, Netherlands |
| | Oberwolfach workshop: Combinatorics | Oberwolfach, Germany |
| 2013 | Simons Institute workshop: Neo-Classical Methods in Discrete Analysis | Berkeley, CA |
| | Rutgers Discrete Math Seminar | Piscataway, NJ |
| | MIT Combinatorics Seminar | Cambridge, MA |
| | Yale Combinatorics and Probability Seminar | New Haven, CT |
| | Microsoft Research Theory Reading Group | Cambridge, MA |
| | Oberwolfach workshop: Combinatorics and Probability | Oberwolfach, Germany |
| 2012 | MIT Combinatorics Seminar | Cambridge, MA |
| | SIAM Conference on Discrete Mathematics | Halifax, NS |
| 2009 | MIT Combinatorics Seminar | Cambridge, MA |

## Professional Services and Activities

Associate Editor, Advances in Mathematics, 2023–

Editorial Advisory Board Member, Springer Graduate Texts in Mathematics, 2022–

AMS–Simons Travel Grants Committee Member, 2021–2024

Co-organizer of the Richard P. Stanley Seminar in Combinatorics, 2017–

Undergraduate first-year advisor, MIT, 2017–

Organizer of the MIT team for the Putnam Competition, 2017–

Scientific Board Member, Prague Summer School on Discrete Mathematics, 2021–

Faculty Advisory Committee, MIT OpenCourseWare, 2022–

MIT Presidential Committee for Distinguished Fellowships, 2023–

## Advising and Mentorship

Current PhD students:

Travis Dillon (co-advised with Henry Cohn)
Dingding Dong (Harvard)
Nitya Mani (co-advised with Pablo Parrilo)
Ashwin Sah
Mehtaab Sawhney

Former PhD students:

Benjamin Gunby (Harvard PhD '21) → Rutgers Hill Assistant Professor
Jonathan Tidor (MIT PhD '22) → Stanford Science Fellow
Aaron Berger (MIT PhD '23) → industry

Undergraduate research supervised:

Yang Liu (2018) → Stanford PhD student
Ryan Alweiss (2018) → Princeton PhD student
Yunkun Zhou (2018–2019) → Stanford PhD student
Mehtaab Sawhney (2018–2020) *Morgan Prize winner* → MIT PhD student
Ashwin Sah (2018–2020) *Morgan Prize winner* → MIT PhD student
David Stoner (2018–2019) *Morgan Prize honorable mention* → Stanford PhD student
Yuan Yao (2019–2020) → MIT PhD student
Shengtong Zhang (2019–2021) → Stanford PhD student
Hung-Hsun Yu (2019–2021) → Cambridge Part III & Princeton PhD student
Mihir Singhal (2019) → Berkeley PhD student
Zachary Chroman (2019) → Cambridge Part III
Carl Schildkraut (2020–2023) → Stanford PhD student
Milan Haiman (2020–2021) → Rutgers PhD student
Anqi Li (2021–2023) → Cambridge Part III & Stanford PhD student
Dain Kim (2021) → MIT PhD student
Mingyang Deng (2022– )
Tomasz Slusarczyk (2022)
Aleksandre Saatashvili (2022– ) → CMU PhD student
Saba Lepsveridze (2022– )
Honglin Zhu (2023– )
Pitchayut (Mark) Saengrungkongka (2023– )
Sanjana Das (2023– )

Postdoctoral researchers mentored:

Zilin Jiang (2018–2020) → Assistant Professor at Arizona State University
László Miklós Lovász (2018–2020) → industry

## Teaching

**Graph Theory and Additive Combinatorics** (graduate, MIT)
*Lecture videos available through MIT OpenCourseWare:* `https://yufeizhao.com/gtacbook/`

| Term | Enrollment (credit + listener) | Instructor evaluation (max 7) |
|---|---|---|
| Fall 2021 | 36 + 9 | 6.7 |
| Fall 2019 | 30 + 14 | 6.9 |
| Fall 2017 | 31 + 17 | 7.0 |

**Probabilistic Methods in Combinatorics** (graduate, MIT)
*Lecture notes:* `https://yufeizhao.com/pm/`

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|---|---|---|
| Fall 2022 | 54 + 12 | 6.9 |
| Fall 2020 | 25 + 16 | Not rated due to COVID |
| Spring 2019 | 47 + 25 | 6.9 |

**Combinatorial Analysis** (undergraduate, MIT)

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|---|---|---|
| Fall 2018 | 22 + 7 | 6.8 |

**Mathematical Problem Solving: Putnam Seminar** (undergrad first-year seminar, MIT)

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|---|---|---|
| Fall 2022 | 21 | 6.4 |
| Fall 2021 | 26 | 6.7 |
| Fall 2020 | 16 | Not rated due to COVID |
| Fall 2019 | 22 | 6.3 |
| Fall 2018 | 22 | 6.4 |
| Fall 2017 | 10 | 6.3 |

**Previous teaching:**

Polynomial Method in Combinatorics, graduate-level, Oxford, 2016
Undergraduate tutorials in geometry, Oxford, 2016

## Other Experiences and Activities

Organizer and Chief Coordinator of Cyberspace Mathematical Competition (CMC) 2020

Quantitative Research Intern, D. E. Shaw & Co., New York

MIT Lusztig PRIMES Mentor

Research Experience for Undergraduates at Duluth participant (mentor: Joe Gallian)

Deputy Leader for Canadian IMO Team

Instructor at Canadian IMO Training Camps

Mentor at AwesomeMath Summer Program, Dallas

Trainer at US Math Olympiad Summer Program (MOP), Lincoln, Nebraska

Teacher at Spirit of Math Schools, Toronto