

# Yuval Wigderson

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## Research interests

Extremal combinatorics, Ramsey theory, algebraic and probabilistic techniques in combinatorics, extremal graph theory, and applications to theoretical computer science.

## Affiliations

<b>ETH Zürich</b> Junior Fellow at the Institute for Theoretical Studies Hosted by Benny Sudakov	2023–present
<b>Tel Aviv University</b> Postdoctoral fellow Hosted by Michael Krivelevich, Wojciech Samotij, and Asaf Shapira	2022–2023
<b>Stanford University</b> PhD in Mathematics, advised by Jacob Fox	2016–2022
<b>Princeton University</b> A.B. in Mathematics, graduated <i>summa cum laude</i>	2012–2016

## Selected fellowships and awards

<i>Discrete Mathematics</i> Outstanding Reviewer Award	2022
George Pólya Teaching Fellow Award	2022
NSF Graduate Research Fellowship	2017–2021
Hertz Fellowship Finalist	2017
Barry Goldwater Scholarship	2015–2016
NSF Center for Science of Information Research Fellowship	2015–2016
George B. Wood Legacy Junior Prize	2015
Middleton Miller '29 Prize	2016
Princeton's PACM Director's Fellowship	2014

## Preprints

D. Bradač, B. Sudakov, and Y. Wigderson, Counting subgraphs in locally dense graphs, 2024. Preprint available at [arXiv:2406.12418](https://arxiv.org/abs/2406.12418).

M. Christoph, A. Martinsson, R. Steiner, and Y. Wigderson, Resolution of the Kohayakawa-Kreuter conjecture, 2024. Preprint available at [arXiv:2402.03045](https://arxiv.org/abs/2402.03045).

A. Girão, Z. Hunter, and Y. Wigderson, Blowups of triangle-free graphs, 2024. Preprint available at [arXiv:2408.12913](https://arxiv.org/abs/2408.12913).

I. Haviv, S. Mattheus, A. Milojević, and Y. Wigderson, Larger nearly orthogonal sets over finite fields, 2024. Preprint available at arXiv:2404.01057.

P. Morawski and Y. Wigderson, Oriented Ramsey numbers of graded digraphs, 2024. Preprint available at arXiv:2405.01069.

Y. Wigderson, Infinitely many minimally non-Ramsey size-linear graphs, 2024. Preprint available at arXiv:2409.05931.

E. Kuperwasser, W. Samotij, and Y. Wigderson, On the Kohayakawa-Kreuter conjecture, 2023. Preprint available at arXiv:2307.16611.

## Publications

J. Fox, X. He, and Y. Wigderson, Ramsey numbers of sparse digraphs, *Israel J. Math.* (2024), to appear. Preprint available at arXiv:2105.02383.

L. Gishboliner, A. Shapira, and Y. Wigderson, An efficient asymmetric removal lemma and its limitations, *Forum Math. Sigma* (2024), to appear. Preprint available at arXiv:2301.07693.

M. Kwan and Y. Wigderson, The inertia bound is far from tight, *Bull. Lond. Math. Soc.* **56** (2024), 3196–3208.

Y. Li, Y. Qiao, A. Wigderson, Y. Wigderson, and C. Zhang, On linear-algebraic notions of expansion, *Theory Comput.* (2024), to appear. Preprint available at arXiv:2212.13154.

Y. Wigderson, Ramsey numbers upon vertex deletion, *J. Graph Theory* **106** (2024), 663–675.

Y. Wigderson, Upper bounds on diagonal Ramsey numbers [after Campos, Griffiths, Morris, and Sahasrabudhe], *Astérisque* (2024), to appear.

D. Conlon, J. Fox, and Y. Wigderson, Off-diagonal book Ramsey numbers, *Combin. Probab. Comput.* **32** (2023), 516–545.

D. Conlon, J. Fox, and Y. Wigderson, Three early problems on size Ramsey numbers, *Combinatorica* **43** (2023), 743–768.

J. Fox, X. He, and Y. Wigderson, Ramsey goodness of books revisited, *Adv. Comb.* (2023), Paper No. 4, 21pp.

J. Fox and Y. Wigderson, Minimum degree and the graph removal lemma, *J. Graph Theory* **102** (2023), 648–665.

J. Fox and Y. Wigderson, Ramsey multiplicity and the Turán coloring, *Adv. Comb.* (2023), Paper No. 2, 39pp.

Y. Li, Y. Qiao, A. Wigderson, Y. Wigderson, and C. Zhang, Connections between graphs and matrix spaces, *Israel J. Math.* **256** (2023), 513–580.

D. Conlon, J. Fox, and Y. Wigderson, Ramsey numbers of books and quasirandomness, *Combinatorica* **42** (2022), 309–363.

L. Sauermann and Y. Wigderson, Polynomials that vanish to high order on most of the hypercube, *J. Lond. Math. Soc. (2)* **106** (2022), 2379–2402.

J. Fox, S. Luo, and Y. Wigderson, Extremal and Ramsey results on graph blowups, *J. Comb.* **12** (2021), 1–15.

X. He and Y. Wigderson, Hedetniemi’s conjecture is asymptotically false, *J. Combin. Theory Ser. B* **146** (2021), 485–494.

A. Wigderson and Y. Wigderson, The uncertainty principle: variations on a theme, *Bull. Amer. Math. Soc. (N.S.)* **58** (2021), 225–261.

Y. Wigderson, An improved lower bound on multicolor Ramsey numbers, *Proc. Amer. Math. Soc.* **149** (2021), 2371–2374.

J. Fox, X. He, and Y. Wigderson, Ramsey, paper, scissors, *Random Structures Algorithms* **57** (2020), 1157–1173.

J. Fox, Y. Wigderson, and Y. Zhao, A short proof of the canonical polynomial van der Waerden theorem, *C. R. Math. Acad. Sci. Paris* **358** (2020), 957–959.

X. He and Y. Wigderson, Multicolor Ramsey numbers via pseudorandom graphs, *Electron. J. Combin.* **27** (2020), Paper No. 1.32, 8pp.

Y. Wigderson, The Bar-Natan theory splits, *J. Knot Theory Ramifications* **25** (2016), 1650014, 19pp.

E. Abbe and Y. Wigderson, High-girth matrices and polarization, in *2015 IEEE International Symposium on Information Theory (ISIT)*, 2015, 2461–2465.

## Teaching and mentorship

### Park City Mathematics Institute

Undergraduate Summer School on Extremal combinatorics Summer 2025

### ETH Zürich lead instructor

Ramsey theory Spring 2024

### ETH Zürich MSc advisor

Advised three Master’s students on theses and semester projects 2023–present

### Stanford University teaching assistant

Math 101 (Math Discovery Lab) Winter 2022

Math 61DM (Modern Mathematics: Discrete Methods) Fall 2021

Math 61DM (Modern Mathematics: Discrete Methods) Fall 2019

### Stanford University course assistant

Math 163/Classics 136 (The Greek Invention of Mathematics) Spring 2022

Math 205B (Real Analysis) Winter 2020

Math 163/Classics 136 (The Greek Invention of Mathematics) Fall 2017

Math 104 (Applied Matrix Theory) Winter 2017

Math 175 (Elementary Functional Analysis) Fall 2016

### Stanford University Directed Reading Program

Mentored nine undergraduate reading projects over several years 2017–2022

### Canada/USA Mathcamp

Academic Coordinator 2020

Graduate student instructor 2017, 2022

Undergraduate counselor 2013, 2015, 2016

## Other professional experience

Program Committee member for STOC 2024 2023

Reviewer for Math Reviews 2021–present

Co-organizer of Stanford’s Combinatorics Reading Seminar 2019–2022

Chaired two hiring committees for Canada/USA Mathcamp 2021–2023

Financial Officer for Stanford’s Graduate Math Outreach Organization 2018–2022

Member of ten hiring committees for Canada/USA Mathcamp 2016–present

Refereed over 50 papers for over 25 journals, including:

*Advances in Mathematics; Annals of Mathematics; Israel Journal of Mathematics; Journal of the LMS; Transactions of the AMS*

## Invited talks

Brazilian School of Combinatorics (**plenary speaker**) 2025

University of Bonn discrete mathematics seminar 2025

Bourbaki seminar 2024

Georgia Tech combinatorics seminar 2024

Carnegie Mellon University ACO seminar 2024

Rutgers University discrete math seminar 2024

Princeton University discrete math seminar 2024

Simons Institute Workshop on Sublinear Graph Simplification 2024

Algebraic graph theory online seminar 2024

Tel Aviv University combinatorics seminar 2024

IST Austria combinatorics, geometry, and topology seminar 2023

ETH-ITS Fellows’ Seminar 2023

TU Graz combinatorics seminar 2023

Oxford University combinatorial theory seminar 2023

Bar-Ilan University combinatorics seminar 2022

Technion combinatorics seminar 2022

CRM workshop on tensors, quantum information, complexity, and combinatorics 2022

Hebrew University combinatorics seminar 2022

Tel Aviv University combinatorics seminar 2022

National University of Singapore combinatorics and graph theory seminar 2022

2022 SIAM conference on Discrete Mathematics 2022

MIT-Harvard-MSR combinatorics seminar 2022

Stanford combinatorics seminar 2021

Moscow Conference on Combinatorics and Applications	2021
Hebrew University combinatorics seminar	2021
University of Massachusetts, Amherst discrete math seminar	2021
Moscow Institute of Physics and Technology geometry and combinatorics seminar	2021
Banach spaces webinar	2021
Princeton University discrete math seminar	2021
University of Wisconsin, Madison analysis seminar	2020
Stanford combinatorics seminar	2020
19th International Conference on Random Structures and Algorithms	2019
Princeton Science of Information Day	2015
IEEE International Symposium on Information Theory	2015