

Zoe Wellner

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Research Interests

I work in the intersection of algebraic topology, combinatorics, and discrete geometry. My research typically goes in one of two directions: describing discrete problems using a topological space where one can then use topological tools, or using motivating questions in combinatorics to develop more broadly applicable topological tools.

Employment

Arizona State University, School of Mathematical and Statistical Sciences
Postdoctoral Research Scholar
Aug 2024 – Present
Tempe, AZ

Education

Carnegie Mellon University, Ph.D. in Algorithms, Combinatorics, and Optimization
Advisor: Florian Frick
Dissertation: *Colorful Equivariant Topological Methods in Discrete Mathematics*
Aug 2018 – May 2024
Pittsburgh, PA

Cornell University, B.A. in Mathematics
Magna Cum Laude
Aug 2014 – May 2018
Ithaca, NY

Publications and Preprints

Covering and labeling generalizations of the Borsuk–Ulam theorem
F. Frick, **Z. Wellner**
arXiv:2509.07247 [↗](#)
Aug 2025
Submitted

Topological methods in zero-sum Ramsey theory
F. Frick, J. Lehmann Duke, M. McNamara, H. Park-Kaufmann, S. Raanes, S. Simon,
D. Thornburgh, **Z. Wellner**
Forum Math. Sigma arXiv:2310.17065 [↗](#)
2025
Accepted

Colorful Borsuk–Ulam theorems and applications
F. Frick, **Z. Wellner**
Fixed Point Theory Appl. arXiv:2309.14539 [↗](#)
2025

New families of simplicial filtration functors
S. Chowdhury, N. Clause, F. Mémoli, J. Á. Sánchez Gómez, **Z. Wellner**
Topology Appl. 279 107254, arXiv:1712.00696 [↗](#)
2020

Flow polytopes of partitions
K. Mészáros, C. Simpson, **Z. Wellner**
Electronic J. Combin. vol. 26 no. 1, arXiv:1707.03100 [↗](#)
2019

Fair division and generalizations of Sperner and KKM-type results
M. Asada, F. Frick, V. Pisharody, M. Polevy, D. Stoner, L. H. Tsang, **Z. Wellner**
SIAM J. Discrete Math 32(1), 591-610, arXiv:1701.04955 [↗](#)
2018

On Reay’s relaxed Tverberg conjecture and generalizations of Conway’s thrackle conjecture
M. Asada, R. Chen, F. Frick, F. Huang, M. Polevy, D. Stoner, L. H. Tsang, **Z. Wellner**
Electronic J. Combin. 25 (3), P3.16, arXiv:1608.04279 [↗](#)
2018

Non-refereed Publications

The geometry and limits of Young partition flow polytopes 2023
A. Goel, **Z. Wellner**
MIT PRIMES: Research Papers

Honors and Awards

Mellon College of Science Hugh Young Graduate Teaching Award 2024
Mathematics Department Outstanding Teaching Prize Nominee 2023
Mathematics Department Diversity, Outreach, and Mentoring Prize 2022
Graduate Student Assembly Departmental Appreciation Award 2019
ARCS Fellowship Recipient 2018-2019

Scholarly Activities

Advising and Mentoring

Summer 2023 Carnegie Mellon University GTDS REU Graduate Research Mentor
Spring 2022-2023 MIT PRIMES Research Mentor
Fall 2017-Spring 2018 Cornell ZigZag Mentoring Founder and Mentor

Service

Fall 2024 AMS Western Sectional at Riverside Special Session Organizer
Spring 2020-2024 Western PA ARML Team and Math Circle Coach and Head Coach
Spring 2023 AMS Central Sectional at Cincinnati Special Session Organizer
Fall 2018-Fall 2023 AWM Chapter at Carnegie Mellon University Founder and President
Spring 2019-2023 Carnegie Mellon University Graduate Student & Postdoc Seminar Organizer

Funded Workshops

Workshop on Tverberg-type problems June 2026
Fields Institute Workshop on Applications in Commutative Algebra May-June 2025
Institute for Advanced Study Women+ and Math Program May 2025
IPAM Computational Interactions between Algebra, Combinatorics, and Discrete Geometry Feb 2025

Teaching

Arizona State University

Fall 2025 MAT 415/512 Combinatorics Instructor
Spring 2025 MAT 243 Discrete Structures Instructor
Fall 2024 MAT 343 Applied Linear Algebra Instructor

Carnegie Mellon University

Spring 2023 MAT 21-120 Calculus I Instructor
Fall 2022 MAT 21-108 Introduction to Concepts Lead Teaching Assistant
Spring 2022 MAT 21-127 Mathematical Concepts Lead Teaching Assistant
Fall 2021 MAT 21-127 Mathematical Concepts Lead Teaching Assistant
Spring 2021 MAT 21-127 Mathematical Concepts Lead Teaching Assistant
Fall 2020 MAT 21-752 Algebraic Topology Grader
Spring 2020 MAT 21-301 Combinatorics Grader
Fall 2019 MAT 21-241 Linear Algebra Teaching Assistant

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| Summer 2019 | MAT 21-127 Mathematical Concepts | Teaching Assistant |
| Spring 2019 | MAT 21-484 Graph Theory | Grader |
| Fall 2018 | MAT 21-752 Algebraic Topology | Grader |

Cornell University

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| Fall 2016-Spring 2018 | Math Support Center | Head Tutor |
| Spring 2016 | Math Support Center | Tutor |
| Fall 2017-Spring 2018 | Calculus Curriculum Improvement | Class Observer |

Summer Camps and Outreach

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| Summers 2021, 2022 | Canada/USA Mathcamp | Mentor and Instructor |
| Summer 2018 | Hefei Ivy Academy | Instructor and Coordinator |

Invited Talks and Presentations

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| DC JMM Special Session on Unconventional Methods in Combinatorics | Jan 2026 |
| Denver AMS Sectional Special Session on Geometric Methods in Combinatorics | Aug 2025 |
| San Diego University Mathematics Seminar | Apr 2025 |
| University of Virginia Topology Seminar | Apr 2025 |
| Arizona State University Postdoc Seminar | Jan 2025 |
| Riverside AMS Sectional Special Session on Topological & Geometric Methods in Combinatorics | Oct 2024 |
| Riverside AMS Sectional Special Session on Advances in Extremal Combinatorics | Oct 2024 |
| Arizona State University Discrete Math Seminar | Sep 2024 |
| Paris Workshop in Topological Combinatorics | Jun 2024 |
| Georgia Tech Combinatorics Seminar | Mar 2024 |
| San Francisco JMM Special Session on Extremal and Probabilistic Combinatorics | Jan 2024 |
| San Francisco JMM Special Session on Bridging Applied and Quantitative Topology | Jan 2024 |
| Bard College Mathematics Seminar | Nov 2023 |
| NYC Geometry Seminar | Sep 2023 |
| CanADAM Minisymposium on Geometric Combinatorics | Jun 2023 |
| Cincinnati AMS Sectional Special Session on Topological & Geometric Methods in Combinatorics | Apr 2023 |
| Carnegie Mellon University ACO seminar | Nov 2022 |
| Carnegie Mellon Math Club Seminar | Sep 2022 |
| Freie Universitat DM/G seminar | May 2022 |
| Iowa State Discrete Math Seminar | Apr 2022 |
| Carnegie Mellon Math Club Seminar | Feb 2022 |
| Carnegie Mellon Seminar for the Undergraduate Research Program | Jun 2019 |