Curriculum Vitae

Florian Frick

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Research interests

Geometric and Topological Combinatorics, Discrete and Metric Geometry, Geometric Topology and Applied Algebraic Topology

Education

04/2012–07/2015	Ph.D., Technische Universität Berlin Funded via the Berlin Mathematical School, advisor: John M. Sullivan
10/2010–11/2014	M.Sc., Technische Universität Berlin
10/2007–08/2010	B.Sc., Technische Universität Berlin

Employment

07/2021–	Associate Professor, Carnegie Mellon University
09/2021–07/2022	Gastprofessor (W3), Acting Head of the Discrete Geometry and Topological Combinatorics research group, Freie Universität Berlin on leave from CMU
07/2018–06/2021	Assistant Professor, Carnegie Mellon University
01/2018–06/2018	H. C. Wang Assistant Professor, Cornell University
08/2017–12/2017	Postdoctoral Fellow, MSRI In the program *Geometric and Topological Combinatorics* and Visiting Scholar, University of California, Berkeley
08/2015–07/2017	H. C. Wang Assistant Professor, Cornell University

Awards and grants

2021–2026	NSF CAREER Grant DMS 2042428
2019–2023	Sloan Research Fellowship
2019–2022	NSF Grant DMS 1855591

07/2016 Richard-Rado-Preis
Dissertation award of the German Mathematics Society DMV for a thesis in discrete mathematics defended in 2014 or 2015; Juror: Ben J. Green

Publications

⋆ undergraduate coauthor • graduate student coauthor

1. **A $\mathbb{Z}_2$-Topological Framework for Sign-rank Lower Bounds**
with Kaave Hosseini and Aliaksei Vasileuski•
arXiv:2604.01510

2. **An optimal Brouwer's fixed point theorem for discontinuous functions**
with Henry Adams
arXiv:2512.14934

3. **Quantifying discontinuity**
with Henry Adams, Michael Harrison, Nikola Sadovek, and Matt Superdock
arXiv:2511.07636

4. **Covering and labeling generalizations of the Borsuk–Ulam theorem**
with Zoe Wellner
arXiv:2509.07247

5. **Geodesic complexity of the octahedron, and an algorithm for cut loci on convex polyhedra**
with Pranav Rajbhandari⋆/•
arXiv:2508.19362

6. **Roots of real-valued zero mean maps: Compositions of linear functionals and equivariant maps**
with Francesca Cantor⋆, Julia D'Amico⋆, and Eric Myzelev⋆
Europ. J. Math. 12, 1 (2026)
arXiv:2503.19729

7. **Youden's Demon is Sylvester's Problem**
with Andrew Newman and Wesley Pegden
Mathematika 71 (2), e70015 (2025)
arXiv:2407.02589

8. **Appendix to D. Kozlov, "Homology and Euler characteristic of generalized anchored configuration spaces of graphs"**
with Martin Raussen
J. Appl. Comput. Topol. 8, 1053–1067 (2024)
doi.org/10.1007/s41468-024-00167-8

9. **Topological methods in zero-sum Ramsey theory**
with Jacob Lehmann Duke⋆, Meenakshi McNamara⋆, Hannah Park-Kaufmann⋆, Steven Raanes⋆, Steven Simon, Darrion Thornburgh⋆, and Zoe Wellner•
Forum Math. Sigma 13, e192 (2025)
arXiv:2310.17065

10. Hausdorff vs Gromov–Hausdorff distances
with Henry Adams, Sushovan Majhi, and Nicholas McBride•
Discrete Comput. Geom. (2025), to appear
arXiv:2309.16648

11. Colorful Borsuk–Ulam theorems and applications
with Zoe Wellner•
J. Fixed Point Theory Appl. 27, 81 (2025)
arXiv:2309.14539

12. Gromov–Hausdorff distances, Borsuk–Ulam theorems, and Vietoris–Rips complexes
with Henry Adams, Johnathan Bush, Nate Clause•, Mario Gómez•, Michael Harrison, R. Amzi Jeffs, Evgeniya Lagoda•, Sunhyuk Lim, Facundo Mémoli, Michael Moy•, Nikola Sadovek•, Matt Superdock, Daniel Vargas•, Qingsong Wang, and Ling Zhou•
Algebr. Geom. Topol., to appear
arXiv:2301.00246

13. Transversal generalizations of hyperplane equipartitions
with Samuel Murray⋆, Steven Simon, and Laura Stemmler⋆
Int. Math. Res. Not. IMRN 2024(7), 5586–5618 (2024)
arXiv:2210.15423

14. Unit sphere fibrations in Euclidean space
with Daniel Asimov, Michael Harrison, and Wesley Pegden
Proc. Edinb. Math. Soc. 67, 287–298 (2024)
arXiv:2210.13981

15. Random complexes with free involution
with Andrew Newman
Israel J. Math. (2023), to appear
arXiv:2210.11316

16. Vietoris thickenings and complexes have isomorphic homotopy groups
with Henry Adams and Žiga Virk
J. Appl. Comput. Topol. 7, 221–241 (2023)
arXiv:2206.08812

17. Colorful words and d-Tverberg complexes
with Amzi Jeffs
Comb. Theory 4(1), Paper No. 3, 13 p. (2024)
arXiv:2205.04776

18. Vertex numbers of simplicial complexes with free abelian fundamental group
with Matt Superdock•
Ars. Math. Contemp. 25, #1.05, 16 p. (2025)
arXiv:2109.11952

19. On inscribed trapezoids and affinely 3-regular maps
with Michael Harrison
Proc. Roy. Soc. Edinburgh Sect. A 154, 1024–1032 (2024)
arXiv:2109.05985

20. Embedding dimensions of simplicial complexes on few vertices
with Mirabel Hu*, Verity Scheel*, and Steven Simon
Ann. Comb. 27, 993–1003 (2023)
arXiv:2109.04855

21. Coupled embeddability
with Michael Harrison
Bull. Lond. Math. Soc. 54 (5), 1609–1629 (2022)
arXiv:2107.09816

22. The topology of projective codes and the distribution of zeros of odd maps
with Henry Adams and Johnathan Bush
Michigan Math. J. 74(4), 775–796 (2024)
arXiv:2106.14677

23. Spaces of embeddings: Nonsingular bilinear maps, chirality, and their generalizations
with Michael Harrison
Proc. Amer. Math. Soc. 150, 423–437 (2022)
arXiv:2010.11996

24. What can you draw?
with Fei Peng*
Amer. Math. Monthly 130 (1), 5–19 (2023)
arXiv:2004.01049

25. The geometry of fair division
Snapshots of modern mathematics from Oberwolfach 2023 (7)
https://doi.org/10.14760/SNAP-2023-007-EN

26. Metric thickenings, Borsuk–Ulam theorems, and orbitopes
with Henry Adams and Johnathan Bush$^\bullet$
Mathematika 66, 79–102 (2020)
arXiv:1907.06276

27. A nonlinear Lazarev–Lieb theorem: L^2-orthogonality via motion planning
with Matt Superdock$^\bullet$
J. Topol. Anal. 14 (3), 569–585 (2022)
arXiv:1906.04417

28. Borsuk–Ulam theorems for products of spheres and Stiefel manifolds revisited
with Yu Hin Chan*, Shujian Chen*, and J. Tristan Hull*
Topol. Methods Nonlinear Anal. 55 (2), 553–564 (2020)
arXiv:1902.00935

29. Fair splittings by independent sets in sparse graphs
with Alexander Black*, Umur Cetin*, Alexander Pacun*, and Linus Setiabrata*
Israel J. Math. 236, 603–627 (2020)
arXiv:1809.03268

30. Barycenters of points in polytope skeleta
with Michael Gene Dobbins
Contemp. Math. 764, 83–88 (2021)
arXiv:1809.01613

31. Splitting loops and necklaces: Variants of the square peg problem
with Jai Aslam*, Shujian Chen*, Sam Saloff-Coste*, Linus Setiabrata*, and Hugh Thomas
Forum Math. Sigma 8, e5 (2020)
arXiv:1806.02484

32. Neural codes, decidability, and a new local obstruction to convexity
with Aaron Chen$^\bullet$ and Anne Shiu
SIAM J. Appl. Algebra Geom. 3 (1), 44–66 (2019)
arXiv:1803.11516

33. On the generalized Erdős–Kneser conjecture: Proofs and reductions
with Jai Aslam*, Shuli Chen*, Ethan Coldren*, and Linus Setiabrata*
J. Combin. Theory, Ser. B 135, 227–237 (2019)
arXiv:1712.03456

34. Chromatic numbers of stable Kneser hypergraphs via topological Tverberg-type theorems
Int. Math. Res. Not. IMRN 2020 (13), 4037–4061 (2020)
arXiv:1710.09434

35. Colorful coverings of polytopes and piercing numbers of colorful d-intervals
with Shira Zerbib
Combinatorica 39 (3), 627–637 (2019)
arXiv:1710.07722

36. Metric reconstruction via optimal transport
with Michał Adamaszek and Henry Adams
SIAM J. Appl. Algebra Geom. 2 (4), 597–619 (2018)
arXiv:1706.04876

37. Achieving rental harmony with a secretive roommate
with Kelsey Houston-Edwards$^\bullet$ and Frédéric Meunier
Amer. Math. Monthly 126 (1), 18–32 (2019)
arXiv:1702.07325

38. On affine Tverberg-type results without continuous generalization
to be rewritten
arXiv:1702.05466

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

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

41. Minkowski complexes and convex threshold dimension
with Raman Sanyal
J. Combin. Theory, Ser. A 151, 202–206 (2017)
arXiv:1607.07814

42. **Intersection patterns of finite sets and of convex sets**
Proc. Amer. Math. Soc. 145 (7), 2827–2842 (2017)
arXiv:1607.01003

43. **On homotopy types of Euclidean Rips complexes**
with Michał Adamaszek and Adrien Vakili*
Discrete Comput. Geom. 58 (3), 526–542 (2017)
arXiv:1602.04131

44. **Barycenters of Polytope Skeleta and Counterexamples to the Topological Tverberg Conjecture, via Constraints**
with Pavle Blagojević and Günter M. Ziegler
J. Europ. Math. Soc. (JEMS) 21 (7), 2107–2116 (2019)
arXiv:1510.07984

45. **Hyperplane mass partitions via relative equivariant obstruction theory**
with Pavle Blagojević, Albert Haase•, and Günter M. Ziegler
Documenta Math. 21, 735–771 (2016)
arXiv:1509.02959

46. **Topology of the Grünbaum–Hadwiger–Ramos hyperplane mass partition problem**
with Pavle Blagojević, Albert Haase•, and Günter M. Ziegler
Trans. Amer. Math. Soc. 370 (10), 6795–6824 (2018)
arXiv:1502.02975

47. **Counterexamples to the topological Tverberg conjecture**
Oberwolfach Reports 12 (1), 318–321 (2015)
arXiv:1502.00947

48. **Nerve complexes of circular arcs**
with Michał Adamaszek, Henry Adams, Chris Peterson, and Corrine Previte-Johnson
Discrete Comput. Geom. 56 (2), 251–273 (2016)
arXiv:1410.4336

49. **Tverberg plus constraints**
with Pavle Blagojević and Günter M. Ziegler
Bull. Lond. Math. Soc. 46 (5), 953–967 (2014)
arXiv:1401.0690

50. **A minimal irreducible triangulation of S^3**
Combinatorial Methods in Topology and Algebra, Springer INdAM Series 12, 49–52 (2015)

Selected invited talks

03/2026	Colloquium University of Pittsburgh
12/2025	Topology and Geometry Seminar University of Florida
11/2025	Geometry Seminar Technische Universität Dresden, Germany

11/2025	Discrete Geometry and Topological Combinatorics Seminar Freie Universität Berlin, Germany
11/2025	Diskrete Mathematik / Geometrie seminar Technische Universität Berlin, Germany
10/2025	Math+ Friday Colloquium, Berlin
03/2025	Spring Topology and Dynamics Conference
01/2025	AMS Special Session *Geometric and Topological Combinatorics* Joint Mathematics Meetings, Seattle
01/2025	AMS Special Session *The Open Neighborhood of Applied Topology* Joint Mathematics Meetings, Seattle
07/2024	Special Session *Discrete and Combinatorial Homotopy, Theory and Applications* Joint Meeting AMS–UMI, Palermo, Italy
01/2024	AMS Special Session *Discrete Homotopy Theory* Joint Mathematics Meetings, San Francisco
01/2024	AMS Special Session *Topological and Algebraic Approaches for Optimization* Joint Mathematics Meetings, San Francisco
12/2023	*Geometric, Algebraic, and Topological Combinatorics*, MF Oberwolfach
06/2023	New trends from Classical Theorems in Geometry, Combinatorics, and Topology Casa Matemática Oaxaca, Mexico
05/2023	GMZ 60: Geometry, Topology, Community, Freie Universität Berlin, Germany
04/2023	Discrete Math / Algebra Seminar, University of Delaware
10/2022	Combinatorics and Discrete Geometry Seminar, Cornell University
10/2022	Algebra Combinatorics Geometry Seminar, University of Pittsburgh
06/2022	Seminar on Nonlinear Algebra, Max Planck Institute, Leipzig
05/2022	Colloquia in Combinatorics, Queen Mary University, London
05/2022	Bridging Applied and Quantitative Topology (online)
11/2021	Facets of Complexity, Freie Universität Berlin
10/2021	AMS Special Session *Geometric and Topological Combinatorics and Their Applications* (online) AMS Fall Central Sectional (formerly at Creighton University)
06/2021	Applied Algebraic Topology Research Network (online)
04/2021	Colloquium, Bard College (online)
03/2021	AMS Special Session Applied Combinatorics (online) Spring Eastern Sectional Meeting (formerly at Brown University)
03/2021	Topology and Geometry Seminar, University of Haifa (online)
02/2021	Topology Seminar, Northeastern University (online)
01/2021	Facets of Complexity, Berlin (online)
10/2020	Combinatorics Seminar, University of Washington (online)

09/2020	Discrete Geometry, MF Oberwolfach (online)
08/2020	Topological Combinatorics Workshop, Charles University, Prague (online)
05/2020	Discrete Math Seminar, Iowa State University (online)
02/2020	Combinatorics Seminar, University of Michigan
11/2019	Atlanta Lecture Series on Combinatorics and Graph Theory Emory University
11/2019	AMS Special Session *Topological Complexity and Related Topics* AMS Fall Southeastern Sectional Meeting, University of Florida
11/2019	AMS Special Session *Geometric and Topological Combinatorics* AMS Fall Southeastern Sectional Meeting, University of Florida
10/2019	Helly and Tverberg type Theorems, CMO, Oaxaca, Mexico
09/2019	AMS Special Session *Algebraic and Geometric Combinatorics* AMS Fall Central Sectional Meeting, University of Wisconsin–Madison
08/2019	*Geometric, Algebraic, and Topological Combinatorics*, MF Oberwolfach
05/2019	Math Club, SUNY Stony Brook
04/2019	Geometry Seminar, CUNY and New York University
04/2019	Algebra/Topology Seminar, University at Albany SUNY
01/2019	ERC Workshop: Adventures in Combinatorial Geometry Ein Gedi, Israel
01/2019	AMS Special Session Geometric and Topological Combinatorics Joint Mathematics Meetings, Baltimore
11/2018	Theoretical Biology Seminar, Pennsylvania State University
10/2018	Math Club, Carnegie Mellon University
07/2018	Combinatorics and Geometry Seminar, University of Washington
04/2018	Combinatorics Seminar, Georgia Tech
04/2018	Discrete Math Seminar, UMass Amherst
04/2018	Colloquium, Lehigh University
04/2018	Topology and Robotics Seminar, Lehigh University
03/2018	ERC Workshop: Geometric Transversals and Epsilon-Nets Ein Gedi, Israel
02/2018	Topology and Geometry Seminar, Binghamton University
01/2018	Colloquium, University of California, Davis
01/2018	AMS Special Session Topological Data Analysis Joint Mathematics Meetings, San Diego
01/2018	Colloquium, University of Illinois at Chicago
12/2017	Colloquium, Northeastern University
12/2017	Colloquium, Carnegie Mellon University
12/2017	Colloquium, Washington University in St. Louis

10/2017	Geometric and Topological Combinatorics: Modern Techniques and Methods Mathematical Sciences Research Institute, Berkeley
08/2017	SIAM Minisymposium on Geometry of Materials SIAM Conference on Applied Algebraic Geometry, Atlanta
06/2017	Discrete Geometry Seminar, Freie Universität Berlin
05/2017	Conference on Discrete Geometry and Algebraic Combinatorics, South Padre Island
04/2017	Geometry Seminar, New York University
03/2017	Topology Seminar, University of Rochester
02/2017	Discrete Geometry and Combinatorics Seminar, Cornell University
01/2017	Combinatorics Seminar, University of Washington
01/2017	Algebra & Discrete Mathematics Seminar, University of California, Davis
12/2016	Topology and Geometry in a Discrete Setting, ICERM, Providence
11/2016	Applied Algebraic Topology Research Network, online seminar
10/2016	Transversal, Helly and Tverberg type Theorems, CMO, Oaxaca, Mexico
09/2016	Special Session Combinatorics, at the Crossroads of Algebra, Geometry, and Topology AMS Sectional Meeting at Bowdoin College
09/2016	Topology and Geometric Group Theory Seminar, Cornell University
07/2016	Symposium on Discrete Mathematics, Freie Universität Berlin
07/2016	Smorgasbord Seminar, Cornell University
06/2016	Pattern Analysis Lab, Colorado State University
05/2016	Topology Festival, Cornell University
03/2016	Combinatorics Seminar, The Ohio State University
01/2016	Algebra & Discrete Mathematics Seminar, University of California, Davis
01/2016	AMS Special Session Algebraic and Topological Methods in Combinatorics Joint Mathematics Meetings, Seattle
10/2015	Oliverclub (Department Colloquium), Cornell University
10/2015	Combinatorics Seminar, University of Miami
10/2015	Topology and Geometry Seminar, Binghamton University
09/2015	Topology and Geometric Group Theory Seminar, Cornell University
06/2015	Algebra and Topology Seminar, University of Copenhagen
06/2015	Applied Topology Seminar, EPF Lausanne
03/2015	Discrete Geometry and Combinatorics Seminar, Cornell University
03/2015	ERC Workshop Discrete Models in Geometry and Topology Freie Universität Berlin
02/2015	Geometric and Algebraic Combinatorics, MF Oberwolfach

11/2014	Topological Combinatorics Seminar, Freie Universität Berlin
07/2014	Workshop Applied Algebraic Topology, CIEM, Castro Urdiales, Spain
04/2014	Topology with combinatorial and geometric flavor Adam Mickiewicz University, Poznań

Postdocs mentored or co-mentored

2023–2025	Marta Pavelka
2022–2025	Alan Lew
2022–2023	Ali Mohammad Nezhad
2021–2024	Amzi Jeffs, NSF postdoc fellowship
2020	Nora Frankl
2020–2025	Andrew Newman
2019–2021	Michael Harrison

Ph.D. students graduated

2024	Zoe Wellner
2022	Jonathan Kliem (at FU Berlin)
2021	Matt Superdock

External Ph.D. committees

08/2025	Nikola Sadovek Freie Universität Berlin, advised by Pavle Blagojević
04/2025	Evgeniya Lagoda Freie Universität Berlin, advised by Pavle Blagojević
09/2023	Tatiana Levinson Freie Universität Berlin, advised by Pavle Blagojević
05/2022	Olakunle Abawonse Binghamton University, advised by Laura Anderson
06/2017	Albert Haase Freie Universität Berlin, advised by Günter M. Ziegler

Undergraduate research advising

2018–	Advised nine CMU undergraduates on honor's theses, research and reading projects.
2023–	Advised nine undergraduate students within my REU *Geometry and Topology in a Discrete Setting*.
2022	Advisor for Pablo Agustin Martin Torres Master's thesis at Freie Universität Berlin.
Summer 2021	Advised four undergraduate students.
Summer 2019	Advised two undergraduate students.
2016–2018	Led undergraduate summer research program on *Topological Methods in Discrete Geometry*. Advised 24 students.

Teaching

Spring 2026	Algebraic Topology (graduate course)
Fall 2024	Discrete Math (graduate course)
Fall 2024	Topological Methods in Combinatorics (graduate course)
Spring 2024	Algebraic Topology (graduate course)
Fall 2023	General Topology (graduate course)
Fall 2023	Discrete Mathematics (graduate course)
Fall 2022	General Topology (graduate course)
Fall 2022	Discrete Mathematics (graduate course)
Summer 2022	Geometry and Topology in a Discrete Setting (graduate course, co-taught with Pavle Blagojević as a block course)
Summer 2022	Student Seminar in Discrete Geometry (graduate course)
Summer 2022	Discrete Geometry II (graduate course)
Winter 2021/22	Discrete Geometry III (graduate course)
Winter 2021/22	Discrete Geometry I (undergraduate course, co-taught with Christian Haase)
Spring 2021	Graph Theory (undergraduate course)
Fall 2020	Discrete Mathematics (graduate course)
Fall 2020	Algebraic Topology (graduate course)
Spring 2020	Differential Geometry of Curves and Surfaces (undergraduate course)
Fall 2019	Discrete Mathematics (graduate course)
Spring 2019	Graph Theory (undergraduate course, co-taught with Wesley Pegden)
Fall 2018	Algebraic Topology (graduate course)
Spring 2018	Prove it! (undergraduate, introduction to proof-based mathematics)
Spring 2018	Introduction to Combinatorics (upper-level undergraduate)
Spring 2017	Seminar in Geometry: Discrete and Metric Geometry

Fall 2016	Topics in Topology: Equivariant Cohomology
Fall 2016	Introduction to Combinatorics (upper-level undergraduate)
Fall 2016	Putnam Practice Sessions (Co-organizer)
Spring 2016	Calculus II
Fall 2015	Putnam Practice Sessions (Co-organizer)
Fall 2015	Calculus I

Editorial activities

2024–	Handling Editor, *Combinatorial Theory*
2026	Co-Chair of the program committee, FPSAC 2026

Refereeing

Referee for journals, conferences, contributions to book projects. Grant review for various funding agencies.

Organizing

- Co-organizer of the ICM Satellite Conference *Combinatorics at the Confluence*
- Co-organizer of the MSRI Summer School *Topological Toolbox for Discrete Mathematicians*
- Co-organizer of the BMS Summer School *Geometry and Topology in a Discrete Setting*
- Co-organizer of the special session *Algebraic, Geometric, and Topological Methods in Combinatorics* at the AMS Spring Eastern Sectional Meeting at Northeastern in April 2018
- Organizer of the *Geometric and Topological Combinatorics Postdoc Seminar* at MSRI during Fall 2017
- Co-organizer of *Topology Festival* at Cornell University
- Co-organizer of *Topology and Geometric Group Theory Seminar* at Cornell University
- Co-organizer of the special session *Geometry and Combinatorics of Cell Complexes* at the Mathematical Congress of the Americas 2017
- Co-organizer of minisymposium *Symmetric simplicial complexes and polytopes* at SIAM Conference on Applied Algebraic Geometry 2017

April 3, 2026