

Diana Halikias

CONTACT

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RESEARCH INTERESTS

Numerical analysis, randomized linear algebra, operator learning, matrix theory, approximation theory

EDUCATION

- 2020 - 2025 Ph.D. in MATHEMATICS, **Cornell University**, Ithaca, NY
Advisor: Alex Townsend
Thesis: *Structured matrix recovery and approximation from matrix-vector products*
NSF Graduate Research Fellow
- 2016 - 2020 B.A. (Intensive) in MATHEMATICS with distinction, **Yale University**, New Haven, CT
Thesis: *Determinantal Processes: Discrete and Continuous Cases*, advised by Richard Kenyon

EXPERIENCE

- Jan. 2026 - 2028 Courant Instructor, **Courant Institute, New York University**, New York, NY
Faculty advisor: Chris Musco
- Fall 2025 Simons-Berkeley Postdoctoral Fellow, **Simons Institute for the Theory of Computing, UC Berkeley**, Berkeley, CA
- Summer 2024 Summer Research Associate, **Flatiron Institute**, New York, NY
Research mentor: Lawrence Saul
- Summer 2023 Research Intern, **Lawrence Berkeley National Laboratory**
Research mentors: Ben Erichson, Michael Mahoney, Dmitriy Morozov
- Summer 2019 Summer Researcher, **Weizmann Institute**, Rehovot, Israel
Research mentor: Bo'az Klartag

PUBLICATIONS AND PREPRINTS

- N. AMSEL, T. CHEN, F. DUMAN KELES, D. HALIKIAS, C. MUSCO, C. MUSCO, AND D. PERSSON. *Quasi-optimal hierarchically semi-separable matrix approximation*. To appear in SIAM J. Matrix Anal. Appl., (2025) [arXiv:2505.16937](https://arxiv.org/abs/2505.16937)
- T. CHEN, F. DUMAN KELES, D. HALIKIAS, C. MUSCO, C. MUSCO, AND D. PERSSON. *Near-optimal hierarchical matrix approximation from matrix-vector products*. Proceedings of the 2025 Annual ACM-SIAM Symposium on Discrete Algorithms (SODA), (2025) [arXiv:2407.04686](https://arxiv.org/abs/2407.04686)
- N. AMSEL, T. CHEN, F. DUMAN KELES, D. HALIKIAS, C. MUSCO, AND C. MUSCO. *Fixed-sparsity matrix approximation from matrix-vector products*. To appear in SIAM J. Matrix Anal. Appl., (2025) [arXiv:2402.09379](https://arxiv.org/abs/2402.09379)
- N. BOULLÉ, D. HALIKIAS, S. OTTO, AND A. TOWNSEND. *Operator learning without the adjoint*. J. Mach. Learn. Res. (2024) [arXiv:2401.17739](https://arxiv.org/abs/2401.17739)
- N. BOULLÉ, D. HALIKIAS, AND A. TOWNSEND. *Elliptic PDE learning is provably data-efficient*. PNAS Brief Report Vol. 120, no. 39, (2023) [doi:10.1073/pnas.2303904120](https://doi.org/10.1073/pnas.2303904120)
- D. HALIKIAS AND A. TOWNSEND. *Structured matrix recovery from matrix-vector products*. Numer. Linear Algebra Appl. e2531, (2023). [doi:10.1002/nla.2531](https://doi.org/10.1002/nla.2531)
- A. YU, C. BECQUEY, D. HALIKIAS, M. E. MALLORY, AND A. TOWNSEND. *Arbitrary depth universal*

approximation theorems for operator neural networks. [arXiv:2109.11354](https://arxiv.org/abs/2109.11354).

D. HALIKIAS, B. KLARTAG, AND B. SLOMKA. *Discrete variants of Brunn-Minkowski type inequalities.* Ann. Fac. Sci. Toulouse Math. (6), Vol. 30, no. 2, (2021), 267–279. doi:10.5802/afst.1674

E. GELERT, D. HALIKIAS, C. KENNEY, AND N. MARSHALL. *A Cheeger inequality for graphs based on a reflection principle.* Involve 13 no. 3, (2020) 475–486. doi:10.2140/involve.2020.13.475

PRESENTATIONS

Unless otherwise stated, the following are invited talks.

May 2026	27th Conference of the International Linear Algebra Society, Virginia Tech
April 2026	Applied and Computational Mathematics seminar, Temple University
March 2026	IDEAS (Applied & Computational Math) seminar, Princeton University
March 2026	Computational Mathematics and Scientific Computing Seminar, New York University
February 2026	Randomized Numerical Linear Algebra workshop, ICERM, Brown University (poster)
October 2025	Linear Systems and Eigenvalues workshop, Simons Institute for the Theory of Computing
June 2025	The 30th Biennial Numerical Analysis Conference, University of Strathclyde
June 2025	Householder Symposium XXII, Cornell University
March 2025	Imperial-UCL Numerics Seminar
March 2025	Computational Mathematics and Applications Seminar, Oxford University
January 2025	Applied mathematics colloquium, Columbia University
November 2024	SIAM NY-NJ-PA section meeting, Rochester Institute of Technology (contributed talk)
October 2024	SIAM-Mathematics of Data Science, Atlanta, Georgia (poster)
May 2024	SIAM-Linear Algebra, Sorbonne University
October 2023	SIAM NY-NJ-PA section meeting, New Jersey Institute of Technology (contributed talk)
August 2023	ICIAM at Waseda University, Tokyo, Japan
July 2023	Synergistic Interactions between Theory and Computation, MIT (poster)
June 2023	Modern Applied and Computational Analysis at ICERM, Brown University (poster)
March 2023	Olivetti Club, Cornell University
November 2022	Olivetti Club, Cornell University
March 2022	Latest trends and insights into matrix theory, iterative methods, and preconditioning, Temple University (poster)

TEACHING EXPERIENCE

New York University

Spring 2026 **Instructor**, Math UA-185.007 (Probability and Statistics)

Cornell University

Fall 2023 **Teaching assistant**, Math 2210 (Linear Algebra)

Yale University

Spring 2020 **Teaching assistant**, Math 231 (Vector Calculus and Linear Algebra II)

Fall 2019 **Teaching assistant**, Math 230 (Vector Calculus and Linear Algebra I)

Spring 2019 **Teaching assistant**, Math 244 (Discrete Mathematics)

Fall 2018 **Teaching assistant**, Math 115 (Calculus II)

RESEARCH FELLOWSHIPS AND AWARDS

2024 **Cornell Graduate School Research Travel Grant** (\$1,300)

2024 **Cornell Graduate School Conference Grant** (\$400)

2024 **SIAM Student Travel Grant** (\$800)

2023 **Cornell Graduate School Conference Grant** (\$700)

2021 **NSF Graduate Research Fellow** (\$138,000)

Awarded 5-year NSF-GRFP fellowship providing 3 years of financial support.

2020 **Cornell Mathematics First Year Fellowship** (\$32,000)

2019 **Yale-Weizmann Summer Science Fellowship**

Awarded travel funding to conduct math research at the Weizmann Institute in Rehovot, Israel.

SERVICE AND OUTREACH

- 2024 - 2025 **Cornell math department teaching seminar**, Organizer
2020 - 2025 **Association for Women in Mathematics Mentorship Program**, Mentor
Mentored three undergraduate women, provided support and guidance on early mathematical careers.
- 2024 - 2025 **Olivetti seminar**, Organizer
2022 - 2024 **Directed Reading Program**, Mentor
Mentored two Cornell undergraduates in reading projects on spectral graph theory.
- 2021 **Cornell Mathematics Department REU**, Mentor
Mentored undergraduate research project in theoretical aspects of deep learning.
- 2021 - 2023 **Graduate Mentorship Program**, Mentor
Mentored incoming graduate students at Cornell on transitioning to graduate life.
- 2021 - 2023 **Little Math Circle**, Leader
Lead and teach weekly creative math circle for elementary school students in the Ithaca area.
- 2020 - 2021 **Cornell Association for Women in Mathematics Chapter**, Officer
Taught \LaTeX workshop for Cornell women in STEM.
- 2017 - 2020 **Yale Association for Women in Mathematics Student Chapter**, President

ACTIVITIES

- 2025 **IPAM Research Collaboration Workshop: Randomized Numerical Linear Algebra (RNLA)**
Participated in research workshop on low-rank approximation and transformers.
- 2022 **MSRI Summer Graduate School on Mathematics of Machine Learning (Courant Institute)**
Nominated by Cornell's math department to attend funded MSRI graduate school on machine learning theory.
- 2018 **Summer Undergraduate Research in Mathematics at Yale (SUMRY)**
Awarded funding to participate in Yale's Research Experience for Undergraduates in mathematics.

TECHNICAL SKILLS AND LANGUAGES

PROGRAMMING: Matlab, Python, \LaTeX
LANGUAGES: English, French, Modern Greek, Chinese (Mandarin)

MISCELLANEOUS

- Host of weekly Cornell graduate student trivia night at the Big Red Barn (2021-2024)
- Awarded second place Montaigne Prize, Yale University Department of French (2020)
- Former student employee in the Numismatics Department of the Yale University Art Gallery (2017-2020)
- Silver Medalist in piano performance, AADGT International Competition; performed twice at Carnegie Hall (2014)