

DAVID BREWSTER

github.com/davidb2 — brewster.cc — dbrewster@g.harvard.edu

EDUCATION

Harvard University		Fall 2022–Present
Ph.D. Applied Mathematics		expected Spring 2027
Advisor #1: Martin Nowak (Evolutionary Dynamics)		
Advisor #2: Philippe Cluzel (Antibiotic Resistance)		
S.M. Applied Mathematics		Spring 2025
University of Illinois at Urbana-Champaign		Fall 2016–Spring 2021
B.S. Computer Science		Spring 2021
B.S. Mathematics		Spring 2021
Advisor #1: Alexander Yong (Algebraic Combinatorics)		
Advisor #2: Kay Kirkpatrick (Biophysics)		

AFFILIATIONS

· Epistemix — <i>Research Fellow</i>	Summer 2025
· Harvard Department of Organismic and Evolutionary Biology (OEB) — <i>Graduate Student (Affiliate)</i>	Fall 2025–Present
· Harvard Department of Molecular and Cellular Biology (MCB) — <i>Graduate Student (Affiliate)</i>	Fall 2024–Present
· Harvard John A. Paulson School of Engineering and Applied Sciences (SEAS) — <i>Graduate Student (Primary)</i>	Fall 2022–Present

AWARDS

· Harvard University Graduate School of Arts and Sciences Prize Fellowship	Fall 2022–Present
· H. Roy Brahana Prize — <i>Most Exceptional Undergraduate Mathematics Career</i>	Spring 2021

TALKS

· “ Maintaining diversity in structured populations ”, <i>Invited seminar talk at SOKENDAI - The Graduate University for Advanced Studies, Research Center for Integrative Evolutionary Science</i> , October 8, 2025	
· “ Fixation times on directed graphs ”, <i>Contributed talk at Evolutionary Graph Theory Workshop at Max-Planck Institute for Evolutionary Biology</i> , October 16, 2024	
· “ Fixation times on directed graphs ”, <i>Invited talk at math research group seminar at Charles University</i> , October 14, 2024	
· “ Fixation times on directed graphs ”, <i>Contributed talk at Workshop on Modeling and Applications of Evolutionary Game Theory</i> , December 8, 2023	
· “ Evolutionary graph theory: fixation times on directed graphs ”, <i>Invited talk at UIUC Algebra-Geometry-Combinatorics seminar</i> , November 2, 2023	
· “ Evolutionary graph theory: fixation times on directed graphs ”, <i>Harvard Theoretical CS “TGINF” PhD/Postdoc seminar</i> , October 26, 2023	
· “ Derandomization using random strings ”, <i>Harvard Theoretical CS “TGINF” PhD/Postdoc seminar</i> , December 1, 2022	
· “ On one-way functions and Kolmogorov complexity ”, <i>Harvard Theoretical CS Pseudorandomness reading group</i> , September 28, 2022	
· “ Coxeter groups and properness ”, <i>Contributed talk at Central Cornfields Combinatorial Conference</i> , May 24, 2021	

PAPERS

7. D. A. Brewster, Y. Huang, M. Mitzenmacher, and M. A. Nowak. Mixed birth-death and death-birth updating in structured populations. *ITCS*, 2026
6. M. Jotautaitė, L. Caviola, **D. A. Brewster**, and T. Hagendorff. Speciesism in ai: Evaluating discrimination against animals in large language models. *arXiv preprint arXiv:2508.11534*, 2025
5. **D. A. Brewster**, J. Svoboda, D. Roscow, K. Chatterjee, J. Tkadlec, and M. A. Nowak. Maintaining diversity in structured populations. *PNAS Nexus*, 4:pgaf252, 2025
4. **D. A. Brewster**, M. A. Nowak, and J. Tkadlec. Fixation times on directed graphs. *PLOS Computational Biology*, 20:e1012299, 2024
3. J. Balogh, D. A. Brewster, and R. Hodges. Proper elements of Coxeter groups. *European Journal of Mathematics*, 10, 2024
2. D. Inafuku, K. L. Kirkpatrick, O. Osuagwu, Q. An, **D. A. Brewster**, and M. Z. Nakib. Channel capacity of the ribosome. *Physical Review E*, 108:044404, 2023
1. D. A. Brewster, R. Hodges, and A. Yong. Proper permutations, Schubert geometry, and randomness. *Journal of Combinatorics*, 13:561–574, 2022

TEACHING

· Mathematical Biology - Evolutionary Dynamics (MATH 242/243) — <i>Teaching Fellow</i>	Fall 2023–Fall 2025
· Topics in Theory for Society: The Theory of Algorithmic Fairness (COMPSCI 226r) — <i>Teaching Fellow</i>	Spring 2024
· Algorithms for Data Science (COMPSCI 224) — <i>Teaching Fellow</i>	Fall 2023
· Perspective Charter Schools Future Techleaders Workshop — <i>Co-instructor, Co-organizer</i>	Fall 2020–Spring 2021
· Intro to Algorithms & Models of Computation (CS 374) — <i>Course Assistant</i>	Fall 2020–Spring 2021
· Software Design Studio (CS 126) — <i>Senior Course Assistant</i>	Fall 2017, Spring 2019–Spring 2020
· Honors Intro to Computer Science (CS 196) — <i>Homework Writer</i>	Fall 2017
· New Horizons GSST STEM Camp: Web Design — <i>Instructor</i>	Summer 2016

GROUPS

· Greener Scott Scholars Mentorship Program — <i>Mentor</i>	Fall 2023–Spring 2024
· Blacks and African Americans in Computing (BAAC @ Illinois) — <i>Organizer</i>	Spring 2019–Spring 2021
· National Society of Black Engineers (NSBE) - UIUC Chapter — <i>Member</i>	Fall 2016–Spring 2021
· Illinois Programming League (IPL) — <i>Bronze at 2017 Mid-Central Regional ACM-ICPC</i>	Fall 2016–Fall 2017

UNDERGRADUATE RESEARCH EXPERIENCE

· New Horizons in Theoretical Computer Science	Summer 2021
· Illinois Combinatorics Lab for Undergraduate Experiences (ICLUE) — <i>Algebraic Combinatorics</i>	Spring 2020–Spring 2021
· Biocomputation Group — <i>Protein Folding and Ribosomal Modeling</i>	Fall 2019–Spring 2021
· Supercomputing Genomics Group — <i>Predicting Tumor Cell Line Responses</i> — <i>Institute for Genomic Biology</i> ¹	Spring 2017

PROFESSIONAL EXPERIENCE

· Akuna Capital — <i>Junior Quantitative Developer, Trade Quality</i> — <i>Chicago, IL</i>	Summer 2021–Summer 2022
· Citadel Securities — <i>Software Engineering Intern, Options Market Making</i> — <i>New York, NY</i>	Summer 2019
· Citadel — <i>Software Engineering Intern, Global Quantitative Strategies</i> — <i>Chicago, IL</i>	Fall 2018
· Two Sigma — <i>Software Engineering Intern, Data Engineering</i> — <i>New York, NY</i>	Summer 2018
· Microsoft — <i>Software Engineering Intern, Azure Compute</i> — <i>Redmond, WA</i>	Spring 2018
· Google — <i>Software Engineering / Site Reliability Engineering Intern, Zipit (Reviews)</i> — <i>New York, NY</i>	Summer 2017

TOOLS

Programming Languages	Python, C/C++, Rust, TypeScript, SageMath, Mathematica, F#, J (APL Dialect)
Frameworks	NetworkX, Node.js, NumPy, Pandas, React, Seaborn, Tensorflow, Torch
Other Tools	AWS, Azure, Bazel, CMake, GCP, K8s, OpenMP, OR-Tools, PyBind, Slurm

¹In collaboration with Argonne National Laboratories