Michael Dougherty (he/him)

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EMPLOYMENT

2022-present	**Lafayette College**, Assistant Professor
2020-2022	**Swarthmore College**, Visiting Assistant Professor
2019-2020	**Colby College**, Visiting Assistant Professor
2018-2019	**Grinnell College**, Visiting Assistant Professor

EDUCATION

2018	**Ph.D. Mathematics**, University of California, Santa Barbara Thesis: *The Geometry and Topology of the Dual Braid Complex* Advisor: Jon McCammond
2014	**M.A. Mathematics**, University of California, Santa Barbara
2012	**B.A. Mathematics with Honors**, Grinnell College

GRANTS, AWARDS AND HONORS

2024-2026	**AIM SQuaRE**, "Dual Right-Angled Artin Groups" with Rachael Boyd, Jon McCammond, Rose Morris-Wright, Chloé Postel-Vinay, Mireille Soergel
2021-2022	**MAA Project NExT Fellow** (Gold '21)
2020	**President's Fund for Racial Justice**, Swarthmore College Course development grant: "Mathematics and Social Justice"
2018	**Excellence in Teaching Award**, UCSB Graduate Student Association
2017	**Outstanding Teaching Assistant**, UCSB Department of Mathematics
2012-2018	**Graduate Fellowship**, National Physical Sciences Consortium

PUBLICATIONS AND PREPRINTS

(mentored undergraduate coauthors denoted with an asterisk*)

10. **Geometric Combinatorics of Polynomials II: Polynomials and Cell Structures**
    preprint, with J McCammond

9. **Continuous Noncrossing Partitions and the Dual Braid Complex**
    preprint, with J. McCammond

8. **Noncrossing Partition Lattices from Planar Configurations**
    Discrete & Computational Geometry (2024), with S. Cohen*, A. Harsh*, S. Martin*

7. **The Polyhedral Tree Complex**
    Combinatorial Theory, 2-3 (2022)

6. **Geometric Combinatorics of Polynomials I: The Case of a Single Polynomial**
    Journal of Algebra, 607-B (2022), with J. McCammond

5. **Boundary Braids**
    Algebraic & Geometric Topology, 20-7 (2020), with J. McCammond, S. Witzel

4. **Critical Points, Critical Values, and a Determinant Identity for Complex Polynomials**
    Proceedings of the American Mathematical Society, 148-12 (2020), with J. McCammond

3. **Undesired Parking Spaces and Contractible Pieces of the Noncrossing Partition Link**
    Electronic Journal of Combinatorics, 25-1 (2018), with J. McCammond

2. **A Decomposition of Parking Functions by Undesired Spaces**
    Electronic Journal of Combinatorics, 23-3 (2016), with M. Bruce*, M. Hlavacek*, R. Kudo*, I. Nicolas*

1. **Hankel Transforms of Linear Combinations of Catalan Numbers**
   Journal of Integer Sequences, 14-11.5.1 (2011), with C. French, W. Qian, B. Saderholm

UNDERGRADUATE RESEARCHERS SUPERVISED

Swarthmore College

2022 Stella Cohen, Andrew D. Harsh, and Spencer Park Martin

University of California, Santa Barbara

2015 Melody Bruce, Max Hlavacek, Ryo Kudo, and Ian Nicolas

TEACHING EXPERIENCE

Lafayette College

Math 104	A World of Mathematics	*Spring 2023 (x2)*
Math 162	Calculus II	*Spring 2024, Fall 2022*
Math 165	Calculus I+ (Workshop Calculus)	*Fall 2023*
Math 263	Calculus III	*Spring 2025 (x2), Fall 2024 (x2)*
Math 351	Abstract Algebra I	*Fall 2023 (x2)*
Math 352	Abstract Algebra II	*Spring 2024*
Math 358	Topology	*Fall 2022*
Math 378	Special Topic: Discrete and Computational Geometry	*Fall 2024*
Math 391	Independent Study (Lie Groups and Lie Algebras)	*Fall 2023*

Swarthmore College

Math 20	Mathematics and Social Justice	*January 2021*
Math 25	Single-Variable Calculus II	*Fall 2021 (x2)*
Math 27	Linear Algebra	*Fall 2020*
Math 67	Introduction to Modern Algebra	*Spring 2022, Spring 2021 (x2)*
Math 77	Advanced Topics in Algebra (Geometric Group Theory)	*Spring 2022*
Math 93	Directed Reading (Reflection Groups and Coxeter Groups)	*Fall 2021*

Colby College

Math 121	Single-Variable Calculus	*Fall 2019 (x2)*
Math 122	Series and Multi-Variable Calculus	*Spring 2020 (x2)*
Math 253	Linear Algebra	*Spring 2020*

Grinnell College

Math 131	Calculus I	*Fall 2018 (x2)*
Math 133	Calculus II	*Spring 2019, Fall 2018*
Math 444	Senior Seminar (Geometric Group Theory)	*Spring 2019*

University of California, Santa Barbara (Instructor of Record)

Math 4A	Linear Algebra with Applications	*Summer 2017, Summer 2016*

University of California, Santa Barbara (Teaching Assistant)

Math 34A	Calculus for the Life and Social Sciences (Head TA)	*Winter 2015*
Math 3A	Calculus I	*Winter 2016*
Math 3B	Calculus II	*Winter 2016*
Math 4A	Linear Algebra with Applications	*Spring 2017, Spring 2016*
Math 6A	Vector Calculus I	*Fall 2016*
Math 8	Transition to Higher Mathematics	*Spring 2018, Winter 2017, Spring 2015, Fall 2014, Winter 2014, Fall 2013*
Math 108A	Advanced Linear Algebra I	*Fall 2017, Fall 2015, Spring 2014*

SELECTED RESEARCH TALKS

(*upcoming talk)

Invited Talks (Conferences and Colloquia)

2024*	AMS Fall Eastern Sectional Meeting *Special Session on Geometric Group Theory*	*Albany, NY*
2024	BIRS Workshop: Combinatorial Nonpositive Curvature	*Banff, Canada*
2023	Spring Topology and Dynamical Systems Conference *Special Session on Geometric Group Theory*	*Rhodes College (virtual)*
2022	Summer@ICERM REU	*Providence, RI*
2022	Bi-College Math Colloquium	*Haverford College*
2021	AMS Spring Southeastern Sectional Meeting *Special Session on Groups, Geometry, and Topology*	*Atlanta, GA (virtual)*
2014	Mathematics and Statistics Student Seminar	*Grinnell College*

Invited Talks (Research Seminars)

2023	University of California, Santa Barbara	*Topology Seminar*
2023	University at Albany	*Algebra/Topology Seminar*
2022	Haverford College	*PATCH - Philadelphia Area Topology (Contact/Hyperbolic)*
2022	University of Pennsylvania	*Deformation Theory Seminar (virtual)*
2022	Temple University	*Geometry & Topology Seminar*
2020	Otto-von-Guericke-Universität Magdeburg	*Algebra & Geometry Seminar (virtual)*
2019	Georgia Institute of Technology	*Geometry & Topology Seminar*
2018	Brown University	*Geometry & Topology Seminar*

Contributed Conference Talks

2020	Joint Mathematics Meetings *AMS Special Session on The Geometry of Complex Polynomials and Rational Functions*	*Denver, CO*
2019	Tech Topology Conference	*Atlanta, GA*
2019	Algorithms in Complex Dynamics and Mapping Class Groups	*Providence, RI*
2018	Tech Topology Conference	*Atlanta, GA*
2017	Tech Topology Conference	*Atlanta, GA*
2016	Tech Topology Conference	*Atlanta, GA*
2016	Topology Students Workshop	*Atlanta, GA*

PEDAGOGICAL DEVELOPMENT AND OUTREACH

2023-2026	**Invited Project Participant**, *Framing Mathematics as a Foundation for Ethical STEM*
Winter 2018	**Mathlab Coordinator**, UC Santa Barbara
2016-2017	**Lead Teaching Assistant** (*Math Department TA Training*), UC Santa Barbara
2016	**Session Speaker** (*Campus-wide orientation for new teaching assistants*), UC Santa Barbara
2013-2015	**Math Circle Instructor** (4 talks given), UC Santa Barbara

INTERDISCIPLINARY ACTIVITIES

2024	**Art and Math Workshop** (with guest artist Gabriel Rico), Lafayette College

DEPARTMENT SERVICE

Seminar and Colloquium Organization

2023-present	Colloquium Co-Organizer	*Lafayette College*
2020-2022	Colloquium Helper	*Swarthmore College*
2018-2019	Colloquium Organizer (*Mathematics and Statistics Student Seminar*)	*Grinnell College*
2013-2018	Seminar Organizer (*Discrete Geometry & Combinatorics Seminar*)	*UC Santa Barbara*
2012-2017	Seminar Co-Organizer (*Hypatian Seminar*)	*UC Santa Barbara*

Department Talks Given

2023	Pi Mu Epsilon Induction Ceremony	*Lafayette College*
2023	Cryptography Competition Kickoff Talk: Diffie-Hellman Key Exchange	*Lafayette College*
2022	Mathematical Adventures and Diversions: Configuration Spaces	*Lafayette College*
2021	Interactive Math Colloquium	*Swarthmore College*
2019	New Math Faculty Colloquium	*Colby College*

Other Contributions

2023-present	Teaching Repository Manager	*Lafayette College*
2023-2024	Tenure-Track Search Committee	*Lafayette College*
2023-2024	Teaching Lunch Co-Organizer	*Lafayette College*
2023-2024	Problem Group Co-Organizer	*Lafayette College*
2023-2024	Linear Algebra Committee	*Lafayette College*
2020-2022	Community Building Helper	*Swarthmore College*

COLLEGE SERVICE

Lafayette Undergraduate Thesis Committees

2025	Hanzhe Zhou (Computer Science and Mathematics, co-advisor) *Processes Between Different Representations of Binary Trees*
2023	Brian Payne (Music) *A Blue Twilight*

PROFESSIONAL SERVICE

Conference Organization

2022 Session Co-Organizer (*Teaching Undergraduate Topology*),
Nearly Carbon Neutral Geometric Topology Conference

Peer Review

Journal Referee (*Journal of Combinatorial Algebra, Proceedings of the AMS*)
Reviewer (*Mathematical Reviews* x3)

CONFERENCES AND WORKSHOPS ATTENDED

(*upcoming conference)

2024*	AMS Fall Eastern Sectional Meeting	*Albany, NY*
2024	Banff International Research Station: Combinatorial Nonpositive Curvature	*Banff, Canada*
2024	Hot Topics: Artin Groups and Arrangements - Topology, Geometry, and Combinatorics	*Berkeley, CA*
2023	AIM Workshop - Geometry and Topology of Artin Groups	*Pasadena, CA*
2023	Framing Mathematics as a Foundation for Ethical STEM	*Washington, DC*
2023	Spring Topology and Dynamical Systems Conference	*(virtual)*
2022	Nearly Carbon Neutral Geometric Topology Conference	*(virtual)*
2022	MAA MathFest	*Philadelphia, PA*
2021	MAA MathFest	*(virtual)*
2021	Artin Groups, CAT(0) Geometry, and Related Topics	*Columbus, OH (virtual)*
2021	Perspectives on Artin Groups	*Edinburgh, Scotland (virtual)*
2021	AMS Spring Southeastern Sectional Meeting	*Atlanta, GA (virtual)*
2020	Joint Mathematics Meetings	*Denver, CO*
2019	Tech Topology Conference	*Atlanta, GA*
2019	ICERM Workshop - Algorithms in Complex Dynamics and Mapping Class Groups	*Providence, RI*
2018	Tech Topology Conference	*Atlanta, GA*
2018	Young Geometric Group Theory VII	*Les Diablerets, Switzerland*
2017	Tech Topology Conference	*Atlanta, GA*
2017	Algebraic and Geometric Combinatorics of Reflection Groups	*Montréal, Canada*
2017	Young Geometric Group Theory VI	*Oxford, England*
2017	Topology Students Workshop	*Atlanta, GA*
2016	Tech Topology Conference	*Atlanta, GA*
2016	MSRI Workshop - Geometry of Mapping Class Groups and Out($\mathbb{F}_n$)	*Berkeley, CA*
2016	FPSAC (Formal Power Series and Algebraic Combinatorics)	*Vancouver, Canada*
2016	Topology Students Workshop	*Atlanta, GA*
2015	AMS Spring Western Sectional Meeting	*Las Vegas, NV*
2014	The Thin Manifold - Graduate Workshop	*Iowa City, IA*
2014	Joint Mathematics Meetings	*Baltimore, MD*
2013	A Day of Triangulations	*Los Angeles, CA*
2013	Joint Mathematics Meetings	*San Diego, CA*
2010	Iowa Summer Research Symposium	*Ames, IA*