

Michael Dougherty

doughemj@lafayette.edu

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

Fellowships and Honors

- 2021 **MAA Project NExT Fellow**, *Gold '21*
- 2020 **Course Development Grant: “Mathematics and Social Justice”**,
President’s Fund for Racial Justice, Swarthmore College
- 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

- 2022 **The Polyhedral Tree Complex**,
Combinatorial Theory, Vol 2, Iss 3
- 2022 **Geometric Combinatorics of Polynomials I: The Case of a Single Polynomial**,
Journal of Algebra, Vol 607, Part B (with J. McCammond)
- 2020 **Boundary Braids**,
Algebraic & Geometric Topology, Vol 20, Iss 7 (with J. McCammond, S. Witzel)
- 2020 **Critical Points, Critical Values, and a Determinant Identity for Complex Polynomials**,
Proceedings of the American Mathematical Society, Vol 148, Iss 12 (with J. McCammond)
- 2018 **Undesired Parking Spaces and Contractible Pieces of the Noncrossing Partition Link**,
Electronic Journal of Combinatorics, Vol 25, Iss 1 (with J. McCammond)
- 2016 **A Decomposition of Parking Functions by Undesired Spaces**,
Electronic Journal of Combinatorics, Vol 23, Iss 3 (with M. Bruce, M. Hlavacek, R. Kudo, I. Nicolas)
- 2011 **Hankel Transforms of Linear Combinations of Catalan Numbers**,
Journal of Integer Sequences, Vol 14, Article 11.5.1 (with C. French, B. Saderholm, W. Qian)

Papers in Preparation

- Geometric Combinatorics of Polynomials II: The Branched Annulus Complex**,
(with J. McCammond)
- Noncrossing Partition Lattices from Planar Configurations**,
(with S. Cohen, A. Harsh, S. Martin)

Undergraduate Research 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 162 Calculus II *Fall 2022*

Math 358 Topology *Fall 2022*

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 2021 (x2), Spring 2022*

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 *Fall 2018, Spring 2019*

Math 444 Senior Seminar (Geometric Group Theory) *Spring 2019*

University of California, Santa Barbara (Instructor of Record)

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

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 2016, Spring 2017*

Math 6A Vector Calculus I *Fall 2016*

Math 8 Transition to Higher Mathematics *Fall 2013, Winter 2014, Fall 2014,
Spring 2015, Winter 2017, Spring 2018*

Math 108A Advanced Linear Algebra I *Spring 2014, Fall 2015, Fall 2017*

Selected Talks

Invited Talks

- 2022
 - PATCH (Philadelphia Area Topology (Contact/Hyperbolic)), Haverford College
 - Summer@ICERM REU
 - Bi-College Math Colloquium, Haverford College
 - Deformation Theory Seminar, University of Pennsylvania
 - Geometry & Topology Seminar, Temple University
- 2021
 - AMS Sectional Meeting: Special Session on Groups, Geometry, and Topology
- 2020
 - Algebra & Geometry Seminar, Otto-von-Guericke-Universität Magdeburg
- 2019
 - Geometry & Topology Seminar, Georgia Tech
- 2018
 - Geometry & Topology Seminar, Brown University
- 2014
 - Mathematics and Statistics Student Seminar, Grinnell College

Conference Talks

- 2020
 - Joint Mathematics Meetings: AMS Special Session on The Geometry of Complex Polynomials and Rational Functions
- 2019
 - Tech Topology Conference
 - Algorithms in Complex Dynamics and Mapping Class Groups
- 2018
 - Tech Topology Conference
- 2017
 - Tech Topology Conference
- 2016
 - Tech Topology Conference
 - Topology Students Workshop

Service

Outreach and Mentoring

- 2012-2017 **Organizer/Speaker**, *Hypatian Seminar*, UC Santa Barbara
 - Building an Academic Website (x2)
 - Math Circle and Talking to Non-Mathematicians
 - Giving Talks in Math
 - What is Institutional Bias? An Open Discussion
 - CV Workshop (x2)
 - Finding Funding for Graduate Students
 - How to Pass Your Quals
- 2016 **Graduate Student Mentor**, *Scholarship for Transfers to Engage and Excel in Mathematics*, UCSB
- 2013-2015 **Instructor**, *Math Circle*, UC Santa Barbara
 - Fibonacci Numbers and Catalan Numbers (x2)
 - Experimenting with Mathematics
 - Pascal's Triangle and Cellular Automata

Research Community

- 2022 **Conference Session Co-Organizer**, *Teaching Undergraduate Topology*,
Nearly Carbon Neutral Geometric Topology Conference
- Journal Referee**
 - Proceedings of the AMS
- Reviewing**
 - Mathematical Reviews

Department

- 2020-2022 **Colloquium Helper**, Swarthmore College
 2020-2022 **Community Building 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
 2010-2012 **Member**, *Math Dept. Student Educational Policy Committee*, Grinnell College

Pedagogical Development

- Winter 2018 **Mathlab Coordinator**, UC Santa Barbara
 2016 **Lead TA**, *Math Department Teaching Assistant Training*, UC Santa Barbara
 2016 **Speaker**, *Campus-wide TA Orientation Session: Leading STEM Discussions in Mixed-Ability Classrooms*, UC Santa Barbara

Conferences Attended

- 2022 Nearly Carbon Neutral Geometric Topology Conference (virtual)
 MAA MathFest Philadelphia, PA
 2021 MAA MathFest (virtual)
 Artin Groups, CAT(0) Geometry, and Related Topics Columbus, OH (virtual)
 Perspectives on Artin Groups Edinburgh, Scotland (virtual)
 AMS Spring Southeastern Sectional Meeting Atlanta, GA (virtual)
 2020 Joint Mathematics Meetings Denver, CO
 2019 Tech Topology Conference Atlanta, GA
 Algorithms in Complex Dynamics and Mapping Class Groups Providence, RI
 2018 Tech Topology Conference Atlanta, GA
 Young Geometric Group Theory VII Les Diablerets, Switzerland
 2017 Tech Topology Conference Atlanta, GA
 Algebraic and Geometric Combinatorics of Reflection Groups Montréal, Canada
 Young Geometric Group Theory VI Oxford, England
 Joint Mathematics Meetings Atlanta, GA
 2016 Tech Topology Conference Atlanta, GA
 MSRI Workshop - Geometry of Mapping Class Groups and $\text{Out}(\mathbb{F}_n)$ Berkeley, CA
 Formal Power Series and Algebraic Combinatorics Vancouver, Canada
 Topology Students Workshop Atlanta, GA
 2015 AMS Spring Western Sectional Meeting Las Vegas, NV
 2014 The Thin Manifold - Graduate Workshop Iowa City, IA
 Joint Mathematics Meetings Baltimore, MD
 2013 A Day of Triangulations Los Angeles, CA
 Joint Mathematics Meetings San Diego, CA
 2010 Iowa Summer Research Symposium Ames, IA