

# 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

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

---

## 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 104	A World of Mathematics	Spring 2023 (x2)
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 Research 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

### 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

### 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

**Reviewer**

Mathematical Reviews

**Pedagogical Development**

Winter 2018 **Mathlab Coordinator**, UC Santa Barbara

2016-2017 **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