

# 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

- to appear **The Polyhedral Tree Complex**,  
*Combinatorial Theory*
- 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*

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## Selected Talks

### Invited Talks

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

### Conference Talks

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

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## 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 Qualls
- 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

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### 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*