

Curriculum Vitae

Megan Fairchild

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EDUCATION

Doctor of Philosophy in Mathematics

Louisiana State University, Baton Rouge, Louisiana

Expected May 2025

Master of Science in Mathematics

Louisiana State University, Baton Rouge, LA (*Coursework*)

May 2022

Texas State University, San Marcos, Texas (*Thesis*)

December 2018

Thesis: Using Knot Theory to Model and Analyze DNA Replication and Recombination.

Bachelor of Science in Mathematics *Cum Laude*

Texas State University, San Marcos, Texas

May 2016

Minor: Computer Science

HONORS AND AWARDS

Research Training Groups (RTG) Fellow

2024-2025

Research Training Groups (RTG) Fellow

2023-2024

Pasquale Porcelli Graduate Student Academic Excellence Award

2021

Texas State Three Minute Thesis (3MT) People's Choice

2018

"Math in the picture" contest winner

2017 & 2018

Academic Excellence, Department of Mathematics

2017 - 2018

Academic Achievement, Department of Mathematics

2014 - 2016

Dean's List

2012 - 2016

MEMBERSHIPS

Organizer: Informal Geometry & Topology Seminar, Louisiana State University

Summer 2024-current

Organizer: Grad Students in 4D, Louisiana State University

Spring 2023-current

Officer: Mathematics Student Colloquium, Louisiana State University

Fall 2022-current

The Topology Group, Texas State University

2016 - 2020

Math Club, Texas State University

2012- 2018

Pi Mu Epsilon, Texas State University

2016 - 2018

National Society of Collegiate Scholars

2013 - 2018

RESEARCH

Submitted for Publication:

"The Non-Orientable 4-Genus of 11 Crossing Non-Alternating Knots." *arXiv:2403.00996 preprint*

2024

Mentored Undergraduate Research:

"Non-Orientable 4-Genus of Torus Knots" *arXiv:2405.04737 preprint*

2024

Research Notes & Course Projects:

"Brunnian Braids and Their Relation to Homotopy Groups of Spheres."

2022

"Using Knot Theory to Model and Analyze DNA Replication and Recombination."

2018

"The Betti Numbers of the Data Set of the Work of Bob Ross."

2018

"Analyzing Betti Numbers of Range Image Patches."

2018

"Analyzing Betti Numbers of the Zodiac Constellations."

2018

"The History of the Alexander Horned Sphere."

2017

"The History of i , the Imaginary Number."

2017

"The Eccentricity of Directed Graphs."

2012

Mentored Undergraduate Research Projects:

“Braids and Configuration Space”	2023
“(1, 1)-Knots and Heegaard Floer Homology”	2023

TEACHING/PROFESSIONAL EXPERIENCE

Graduate Instructional Assistant - Louisiana State University	August 2020 - current
Instructor - Calculus I	
Lead TA - Business Calculus	
TA - Business Calculus	
Lecturer - Texas State University	August 2019 - July 2020
Co-Coordinator: Contemporary Mathematics Teaching Forum	
Contemporary Mathematics	
Co-Enroll Intermediate and College Algebra	
Co-Enroll Elementary Algebra and Contemporary Mathematics	
Graduate Instructional Assistant - Texas State University	January 2017 - December 2018
Instructor - Intermediate Algebra	
TA - Calculus II	
TA - Pre-Calculus	
Undergraduate Instructional Assistant	Fall 2014 & Fall 2015
TA - Pre-Calculus	
Private Tutoring/ Math Tutoring Lab at Texas State	Fall 2014 - Fall 2017
College Algebra	
Pre-Calculus	
Calculus I, II, & III	
Linear Algebra	
Differential Equations	
Modern Algebra/Abstract Algebra	
Topology	
Paper Grader	Spring 2016
Modern Algebra	
Introduction to Advanced Mathematics	

PRESENTATIONS & TALKS

Invited Talks:

University of Nevada Reno Math Colloquium: The Non-Orientable 4-genus of Knots.	2024
AMS Sectional FSU: The Non-Orientable 4-genus of Knots.	2024
Formal Topology Seminar (LSU): The Non-Orientable 4-genus of Knots.	2024

Informal Topology Seminar & Other Research Presentations:

The Non-Orientable 4-genus of Knots.	2023
Smooth versus Topological Concordance via Whitehead Doubles.	2023
Brunnian Braids and Their Relation to Homotopy Groups of Spheres.	2022
Modeling DNA Replication and Recombination with Knot Theory.	2018
Analyzing Betti Numbers of Range Image Packages.	2018
The History of Imaginary and Complex Numbers.	2017
The History of the Alexander Horned Sphere.	2017
Heroes of Homology.	2017

CONFERENCES ATTENDED

Topology Students Workshop - Vanderbilt University <i>Talk Title: Non-Orientable 4-Genus of Knots</i>	June 2024
Topology Summer School & Conference - University of Georgia <i>Lightning Talk: Non-Orientable Surfaces in Knot Traces</i>	May 2024
AMS Sectional - Florida State University <i>Talk Title: Non-Orientable 4-Genus of Knots</i>	March 2024
Texas Geometry and Topology - Rice University	November 2023
SEC Topology - University of Alabama	June 2023
Topology Conference - University of Georgia	May 2023

LANGUAGES

Spanish	<i>Intermediate Speaker</i>
Coding Languages: C++, Python, MatLab, L ^A T _E X	