

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

May 2022

Texas State University, San Marcos, Texas

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

FELLOW: Research Training Groups (RTG)

2024-2025

FELLOW: Research Training Groups (RTG)

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

PUBLICATIONS & PREPRINTS

Submitted for Publication:

THE NON-ORIENTABLE 4 GENUS OF 11 CROSSING NON-ALTERNATING KNOTS.

2024

Preprint: arXiv:2403.00996

NON-ORIENTABLE 4 GENUS OF TORUS KNOTS

2024

Preprint: arXiv:2405.04737

Mentored Undergraduate Research Projects:

Braids and Configuration Space

2023

(1, 1)-Knots and Heegaard Floer Homology

2023

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

TEACHING

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

COLLOQUIA, CONFERENCE, & SEMINAR TALKS

Invited Talks:

THE NON-ORIENTABLE 4 GENUS OF KNOTS.

Math Colloquium: University of Nevada Reno	2024
AMS Sectional at University at Albany	2024
Topology Students Workshop at Vanderbilt	2024
AMS Sectional at Florida State University	2024
Geometry & Topology Seminar (LSU)	2024

Lightning Talks:

NON-ORIENTABLE SURFACES IN KNOT TRACES.

Topology Conference at University of Georgia	2024
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Informal Topology Seminar & Other Research Presentations:

The Non-Orientable 4 Genus of Torus Knots.	2024
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
Legendrian Knots & DGA.	2021
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

PROFESSIONAL SERVICE

CURRICULUM DEVELOPMENT:

Co-Coordinator of Contemporary Mathematics, Texas State University Spring 2020
Re-structured syllabus, created course material currently being used

OFFICER:

Mathematics Student Colloquium Committee Fall 2022 - current

ORGANIZER:

Informal Geometry & Topology Seminar, Louisiana State University Summer 2024-current
Grad Students in 4D, Louisiana State University Spring 2023-current

MENTOR FOR UNDERGRADUATE RESEARCH:

Oversaw research via directed reading program Spring 2024
Led vertically integrated research course Fall 2022-Current

MENTAL HEALTH ALLY:

GEAUX Math LSU (new graduate student orientation) Fall 2021-current
On the list of 'people to talk to' since Fall 2021, panelist for surviving graduate school
Certified Ally at Texas State University Fall 2019

WEBSITE DEVELOPMENT:

What to Expect for your General Exam Summer 2024
A website to help younger graduate students prepare for their general exam

CONFERENCES ATTENDED

AMS Sectional - University at Albany October 2024
Topology Students Workshop - Vanderbilt University June 2024
Topology Summer School & Conference - University of Georgia May 2024
AMS Sectional - Florida State University 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 *Intermediate Speaker*

Coding Languages: C++, Python, MatLab, HTML, \LaTeX

MEMBERSHIPS

American Mathematical Society current
Math Club, Texas State University 2012- 2018
Pi Mu Epsilon, Texas State University 2016 - 2018
National Society of Collegiate Scholars 2013 - 2018