

Nicholas (Nick) Meyer

Mathematics PhD Candidate

 <https://nickmeyer.me>

 nicholas.meyer2@huskers.unl.edu

About me

I am a sixth-year Mathematics PhD Candidate at University of Nebraska specializing in low-dimensional topology. I'm primarily interested in knot theory and manifold decompositions in dimensions three and four. I am advised by Dr. Alex Zupan.

Education

In Progress

Ph.D. in Mathematics

University of Nebraska – Lincoln

May 2020

M.S. in Mathematics

University of Nebraska – Lincoln

May 2018

B.S. in Mathematics (Minor: Physics)

Cum Laude, Winona State University

Relevant Coursework

General and Algebraic Topology

Differential Topology

Topological Data Analysis

Knot Theory

Homological & Commutative Algebra

Low-Dimensional Topology

Publications

July 2023

Pants distances of knotted surfaces in 4-manifolds

Joint work with R. Aranda, S. Blackwell, D. Gulati, H. Karimi, G. Kim, and P. Pongtanapaisan. *Submitted.* arXiv

June 2023

Tri-plane Diagrams for simple surfaces in S^4

Joint work with W. Allred, M. Aragón, Z. Dooley, A. Goldman, Y. Lei, I. Martinez, D. Peters, S. Warrander, A. Wright, and A. Zupan. In *Journal of Knot Theory and its Ramifications*. doi:10.1142/S0218216523500414

Selected Talks

March 2023

Group Deficiencies from a 4-manifolds perspective

Groups, Semigroups, and Topology Seminar, University of Nebraska – Lincoln

September 2022

The Casson-Gordon signature invariant and sliceness obstructions

Groups, Semigroups, and Topology Seminar, University of Nebraska – Lincoln

August 2022

Slice Knots and Classical Sliceness Obstructions

Graduate Students Talking Groups, Semigroups, and Topology Seminar, UNL

June 2022

Meier-Zupan Square Links and The Andrews-Curtis Conjecture

New Developments in Four Dimensions, Victoria BC

April 2022

Ends of Surfaces and Classification Theorems

Groups, Semigroups, and Topology Seminar, UNL

February 2022

A quest for residual finiteness: Geometrization and the word problem for 3-manifolds

Groups, Semigroups, and Topology Seminar, UNL

October 2021

Maps from 3-manifolds to 4-manifolds that induce isomorphism on fundamental groups (Part 2)

Groups, Semigroups, and Topology Seminar, UNL

June 2021

A Geometric Introduction to Heegaard Splittings and Trisections

GOSS (Graduate Online Seminar Series), Online

March 2021

Pants: An Introduction to Oriented Cobordism Theory

Graduate Students Talking Groups, Semigroups, and Topology Seminar, UNL

October 2020

Heegaard splittings and trisections 101

Groups, Semigroups, and Topology Seminar, UNL

November 2019

Trisections from Morse 2-functions

4-Manifolds Seminar, UNL

September 2019

Heegaard-Kirby Diagrams for Trisections of 4-Manifolds

4-Manifolds Seminar, UNL

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Selected Conference/Workshop Participation

June 2022	New Developments in Four Dimensions
June 2022	Junior Trisectors Retreat
July 2021	Gauge Theory in Geometry and Topology, Summer Graduate School at MSRI
June 2021	Nearly Carbon Neutral Topology Conference
June 2021	Georgia Topology Conference 2021
June 2021	Summer Trisectors Workshop 2021
December 2020	Winter Trisectors Workshop 2020
June 2020	Nearly Carbon Neutral Topology Conference
September 2019	Midwest Geometry Conference

Awards and Honors

May 2018	Winona State University Distinguished Graduate in Mathematics
April 2018	SIMIODE SCUDEM 2018 Won local Mathematical Modeling competition
November 2017	PME Wisconsin Section- Math Group Competition Membership in winning team of the group competition.

Other Activities

March 2022	Graduate Student Visit Panelist Sat on a panel of current graduate students during visit weekend for admitted graduate students.
November 2021	Winona State Graduate Student Panelist Sat on a panel of current graduate students from my alma matre to speak about graduate student life and graduate school to undergraduate students.
Summer 2021	Polymath REU Jr. 2021 Mentored for an undergraduate research program with Alex Zupan on bridge trisections and knotted surfaces.
Summer 2021	SIPS-GT 2021 Organized an online weekly summer seminar on the Generalized Property R Conjecture and the Andrews-Curtis Conjecture.
October 2019	Graduate Student Visit Guide Served as an organizer, panelist, and guide for Winona State's annual Mathematics and Statistics Department graduate school visit.

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Professional Experience

August 2018 – Present

Graduate Teaching Assistant

University of Nebraska – Lincoln

I taught many undergraduate courses using active learning methods, both in-person and at a distance, much of which occurred during the COVID-19 pandemic. I also served as associate convener for several courses, meaning I oversaw multiple sections with an average enrollment of 300+ students per semester. I have also done a significant amount of course development, including leading the development of a course workbook for UNL's Multivariable Calculus course.

May 2023 – August 2023

NSF INTERNship

Ocuvera

I received an NSF INTERN grant to work with Ocuvera during the Summer of 2023. I implemented a new machine learning architecture in PyTorch that improved the precision of Ocuvera's fall detection system. I also developed a novel visualization system for the output of this model.

May 2018 – July 2018

Learning Clinician

Lindamood-Bell Learning Processes

I aided students aged 5-21 with various learning disabilities in their journeys learning to read, spell, and do math using peer-reviewed, differentiated instructional techniques.

August 2016 – May 2018

Math, Statistics, and Physics Peer Tutor

Winona State University

I assisted peers in maximizing learned content and developing good study skills. I also led small-group and individualized study sessions for Mathematics and Physics Classes.

June 2017 – August 2017

Observatory Upgrade Technician

Winona State University

I developed and tested an open-source observatory motor controller using Python, Arduino, and Raspberry Pi.

June 2016 – January 2017

Data Coordinator Intern

BI Worldwide

I helped design and develop an invoice processing system using Python and BASH scripting. I also collected and managed product data using Excel and OracleDB.

Teaching Experience

Calculus II

Recitations: F18, Sp19, Su19

Multivariable Calculus

Instructor: Sp23

Recitations: F22, F23

Course Development: Su22

College Algebra

Instructor: F19

Applied Calculus

Instructor: Su20

Contemporary Mathematics

Instructor: Sp20, F20, Sp21

Associate Convener: Sp21

College Algebra and Trigonometry

Instructor: F21

Associate Convener: F21, Sp22

Course Development: Su22