



# Nicholas (Nick) Meyer

 <https://nickmeyer.phd>

 [nmeyer@ucmo.edu](mailto:nmeyer@ucmo.edu)

## About me

I am an Assistant Professor of Mathematics at the University of Central Missouri specializing in low-dimensional topology. I'm primarily interested in knot theory and manifold decompositions in dimensions three and four.

I did my PhD at the University of Nebraska — Lincoln under the guidance of Dr. Alex Zupan.

## Professional Experience

August 2024 – Present

**Assistant Professor of Mathematics**  
*University of Central Missouri*

August 2018 – July 2024

**Graduate Teaching Assistant**  
*University of Nebraska – Lincoln*

Taught many undergraduate courses using active learning methods, both in-person and at a distance, much of which occurred during the COVID-19 pandemic. Oversaw multiple sections with an average enrollment of 300+ students per semester. Performed 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*

Implemented a new machine learning architecture in PyTorch that improved the precision of Ocuvera's fall detection system. Developed a novel visualization system for the output of this model.

August 2016 – May 2018

**Math, Statistics, and Physics Peer Tutor**  
*Winona State University*

Assisted peers in maximizing learned content and developing good study skills. Led small-group and individualized study sessions for Mathematics and Physics classes.

## Education

July 2024

**Ph.D. in Mathematics**

Advised by Dr. Alex Zupan  
University of Nebraska – Lincoln (UNL)

May 2020

**M.S. in Mathematics**

UNL  
**B.S. in Mathematics (Minor: Physics)**  
Cum Laude, Winona State University

May 2018

## Relevant Coursework

General and Algebraic Topology  
Differential Topology  
Topological Data Analysis

Knot Theory  
Homological & Commutative Algebra  
Low-Dimensional Topology

## Publications

July 2024

**Torus Surgery, Fibrations, Multisections, and Spun 4-Manifolds**

PhD Dissertation. ProQuest

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:2307.13874

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



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## Selected Talks

- October 2023 **Torus surgeries on the Hopf surface**  
AMS Fall Central Sectional Meeting, Creighton University
- March 2023 **Group Deficiencies from a 4-manifolds perspective**  
Groups, Semigroups, and Topology Seminar, UNL
- September 2022 **The Casson-Gordon signature invariant and sliceness obstructions**  
Groups, Semigroups, and Topology Seminar, UNL
- June 2022 **Meier-Zupan Square Links and The Andrews-Curtis Conjecture**  
New Developments in Four Dimensions, University of Victoria
- 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 4-Manifolds 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

## Selected Conference/Workshop Participation

- January 2025 **Joint Mathematics Meeting**
- June 2024 **Trisectors Workshop 2024**
- 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**



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## Service

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 mater 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.

## Programming Languages

Python  
C/C++  
R

Mathematica  
SQL  
Bash/Zsh