

## EDUCATION

---

**University of Kentucky**, Lexington, KY 2024-Present  
Ph.D. in Mathematics

**University of Wisconsin-Eau Claire**, Eau Claire, WI May 2024  
B.S. in Mathematics with Research Emphasis GPA: 3.51/4.0  
Minor: Computer Science

## RESEARCH PAPERS

---

### Published

- Otto, C., & Schrader, J. (2024). Patterns of  $\alpha$ -open Sets in Finite Topological Spaces. *McNair National Research Journal*, 3.
- Otto, C., & Schrader, J. (2024). Analyzing pretzel links through grid diagrams and winding numbers. *ASTRA: The McNair Scholars' Journal*, 2024.
- Mbirika, A., Schrader, J., & Spilker, J. (2023). Pell and Associated Pell Braid Sequences as GCDs of Sums of  $k$  Consecutive Pell, Balancing, and Related Numbers. *J. Integer Sequences*, 26(6).

### Accepted

- Otto, C., Schrader, J. Exploring the combinatorics of pretzel links through grid diagrams. (Accepted to *Research in the Mathematical Sciences*, Special Edition: Cutting EDGE Mathematics: Celebrating the 25<sup>th</sup> Anniversary of the EDGE Program)

### Submitted/In Preparation

- Schrader, J., Shull, W. Spanning Trees with few Branch Vertices in a Chair-Free Graph. (Submitted to *Graphs and Combinatorics*)

## PROFESSIONAL EXPERIENCE

---

**National Institute for Modeling Biological Systems - University of Tennessee, Knoxville** June 2024  
Enhancing Diversity in Graduate Education (EDGE) Summer Program

**An Exploration of Game Theory & Artificial Intelligence** Nov 2021  
AIMS Research Group - University of Wisconsin-Eau Claire

**Python and Machine Learning Programming Workshop** Sep 2021  
AIMS Research Group - University of Wisconsin-Eau Claire

## RESEARCH EXPERIENCE

---

*A Class of Virtual Knots with Crossing Weight Zero* Sep 2023-May 2024  
University of Wisconsin-Eau Claire  
Advisor: Dr. Carolyn Otto

*A combinatorial approach to constructing 3-manifolds* Jun 2023-Aug 2023  
University of Wisconsin-Eau Claire  
Advisor: Dr. Carolyn Otto

*Spanning trees with few branch vertices* Jun 2023-Aug 2023  
University of Wisconsin-Eau Claire  
Advisor: Dr. Warren Shull

*GCD of sums (and sums of squares) of  $k$  consecutive Jacobsthal numbers* Jun 2023-Aug 2023  
University of Wisconsin-Eau Claire  
Advisor: Dr. aBa Mbirika

*Combinatorics used to determine the topology of manifolds* Sep 2022-May 2023  
University of Wisconsin-Eau Claire  
Advisor: Dr. Carolyn Otto

*Number-theoretic explorations of the Pell and Pell-Lucas sequences*  
University of Wisconsin-Eau Claire  
Advisor: Dr. aBa Mbirika

Jun 2022-May 2023

*Patterns of  $\alpha$ -open sets in finite topological spaces*  
University of Wisconsin-Eau Claire  
Advisor: Dr. Carolyn Otto

Sep 2022-Dec 2022

## PRESENTATIONS

---

<i>Markov Chains and Population Dynamics</i> EDGE Summer Program Colloquium	June 2024
<i>Domain coloring of complex functions</i> with E. Olden and B. Wacker 32 <sup>nd</sup> Annual Mathematics Retreat, Eau Claire, WI	Apr 2024
<i>A class of virtual knots with crossing weight zero</i> Provost's Honor Symposium, Eau Claire, WI	Apr 2024
<i>Exploring the combinatorics of pretzel links through grid diagrams</i> Nebraska Conference for Undergraduate Women in Mathematics, Lincoln, NE	Jan 2024
<i>Exploring the combinatorics of pretzel links through grid diagrams</i> Joint Mathematics Meetings, San Francisco, CA	Jan 2024
<i>Pretzel links: a grid diagram approach</i> McNair Research Symposium, Eau Claire, WI	Dec 2023
<i>Combinatorics of Grid Diagrams</i> Summer Research Institute Colloquium, Eau Claire, WI	Aug 2023
<i>The McNugget Monoid</i> Abstract Algebra Colloquium, Eau Claire, WI	May 2023
<i>Combinatorics of Grid Diagrams</i> Research Seminar, Eau Claire, WI	Apr 2023
<i>Pell and associated Pell braid sequences as GCDs of sums of <math>k</math> consecutive Pell, balancing, and related numbers</i> National Conference on Undergraduate Research, Eau Claire, WI	Apr 2023
<i>Pell and associated Pell braid sequences as GCDs of sums of <math>k</math> consecutive Pell, balancing, and related numbers</i> Underrepresented Students in Topology and Algebra Research Symposium, Seattle, WA	Mar 2023
<i>GCD of sums of <math>k</math> consecutive Pell, balancing, and related numbers</i> Nebraska Conference for Undergraduate Women in Mathematics, Lincoln, NE	Jan 2023
<i>GCD of sums of <math>k</math> consecutive Pell, balancing, and related numbers</i> Joint Mathematics Meetings, Boston, MA	Jan 2023
<i>Patterns of <math>\alpha</math>-open sets in finite topological spaces</i> Research Colloquium, Eau Claire, WI	Dec 2022

## AWARDS AND FELLOWSHIPS

---

### Awarded

Max Steckler Fellowship, University of Kentucky	2024-2025
Outstanding Achievement in Mathematics, University of Wisconsin-Eau Claire	2024
Ronald E. McNair Scholar, United States Department of Education TRIO Program	2022-2024
American Association of University Women - Eau Claire Branch Scholarship, University of Wisconsin-Eau Claire	2023-2024
Fred F. and Lorain E. Winrich Scholarship, University of Wisconsin-Eau Claire	2023-2024

Karlgard Mathematics Scholarship, University of Wisconsin-Eau Claire	2023-2024
Kell Container Corporation Scholarship, Office of Research and Sponsored Programs	2023-2024
TRIO Day Newcomer Award, Ronald E. McNair Program	2023
STEM Opportunity Fund, University of Wisconsin-Eau Claire	2023
Nan Pickett Memorial Scholarship, University of Wisconsin-Eau Claire	2022-2023
Returning Adult Scholarship, University of Wisconsin-Eau Claire	2022-2023
SQL Writing Competition (Placed), University of Wisconsin-Eau Claire	2021
<b>Nominated</b>	
Goldwater Nominee, Barry M. Goldwater Scholarship	2023

## RELEVANT EXPERIENCE

---

<b>University of Wisconsin-Eau Claire, Eau Claire, WI</b>	
• <i>Dean of Students Intern/Clerical Assistant</i> , Dean of Students Office	Fall 2022-July 2024
• <i>Teaching Assistant</i> , Math 109: Algebra for Calculus	Fall 2023
• <i>Teaching Assistant</i> , Math 324: Linear Algebra	Spring 2023
• <i>Math Tutor</i> , Multicultural Student Services	Spring 2023
• <i>Teaching Assistant</i> , Math 314: Discrete Mathematics	Fall 2022

## SERVICE ACTIVITIES

---

<b>University of Wisconsin-Eau Claire, Eau Claire, WI</b>	
• Volunteer: Campus Closet	2024
• Member: Math Club	2022-2024
• Member: Organization for Minorities in Technology	2021-2024
• Volunteer: Sonia Kovalevsky Day	2023
• Volunteer: High School Math Meet	2023
• Volunteer: Math Club Book Sale	2022
• Member: Student Association for Computing Machinery	2021