

Anthony Christiana

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Research Interests

My research interests include knot theory, quandles, diagrammatic algebras, skein modules, homology of quasi-groups, domination in graphs, and solutions to the Yang-Baxter equation.

Education

The George Washington University

August 2022 – May 2027

Ph.D. in Mathematics (expected May 2027)

- M.A. in Mathematics (GWU)
- Advisor: Józef H. Przytycki
- Dissertation: *Braid Algebras*

Hamilton College

August 2018 – May 2022

B.A. in Mathematics and Music, magna cum laude

- Honors in Mathematics
- Phi Beta Kappa

Publications & Preprints

Low Dimensional Homology of the Yang–Baxter Operators Yielding the HOMFLYPT Polynomial

2026

Anthony Christiana, Ben Clingenpeel, Huizheng Guo, Jinseok Oh, Józef H. Przytycki, Xiao Wang, and Hongdae Yun

Accepted for publication in *Homology, Homotopy and Applications*.

[arXiv:2502.20659](#) [🔗](#)

Using Fibonacci numbers and Chebyshev polynomials to express Fox coloring groups and Alexander–Bureau–Fox modules of diagrams of wheel graphs

2026

Anthony Christiana, Huizheng Guo, and Józef H. Przytycki

Contemporary Mathematics 834 (2026), 109–129.

[doi:10.1090/conm/834/16687](#) [🔗](#) [arXiv:2310.19979](#) [🔗](#)

On The Secure Domination of Mycielskian Graphs

2026

Kiran R. Bhutani, Anthony Christiana, and Peter Ulrickson

Preprint; submitted to *Ars Combinatoria*.

[arXiv:2603.17897](#) [🔗](#)

Fundamentals of cubic skein modules

2025

Rhea Palak-Bakshi, Anthony Christiana, Huizheng Guo, Dionne Ibarra, Louis H. Kauffman, Gabriel Montoya-Vega, Sujoy Mukherjee, Józef H. Przytycki, and Xiao Wang

Preprint; submitted to *Advances in Mathematics*.

[arXiv:2511.10959](#) [🔗](#)

In Search of Homology for Quasigroups of Bol–Moufang Type	2025
Anthony Christiana, Ben Clingenpeel, Huizheng Guo, Jinseok Oh, Józef H. Przytycki, and Anna Zamojska-Dzienio	
Conditionally accepted for conference proceedings; revised version submitted.	
arXiv:2508.21268 	
Chebyshev polynomials and Gram determinants from the Möbius band	2025
Anthony Christiana, Dionne Ibarra, and Gabriel Montoya-Vega	
Accepted for publication in Contemporary Mathematics.	
arXiv:2504.16439 	
Psyquandle coloring quivers	2023
Jose Cenicerros, Anthony Christiana, and Sam Nelson	
<i>Journal of Knot Theory and Its Ramifications</i> 32(11) (2023), 2350073.	
doi:10.1142/S0218216523500736 	

Teaching

Lecturer / Instructor of Record

MATH 1221: Calculus with Precalculus 2, George Washington University	Summer 2026
MATH 1007: Mathematics and Politics, George Washington University	Summer 2026
MATH 111: Calculus for Social & Life Sciences, Catholic University of America	Summer 2025
MATH 1007: Mathematics and Politics, George Washington University	Summer 2024
MATH 1007: Mathematics and Politics, George Washington University	Summer 2023

Teaching Assistant

MATH 1009 Mathematical Ideas	Spring 2026
MATH 1009 Mathematical Ideas	Fall 2025
MATH 1009 Mathematical Ideas	Spring 2025
MATH 1009 Mathematical Ideas	Fall 2024
MATH 1232 Single-Variable Calculus II	Spring 2024
MATH 1231 Single-Variable Calculus I	Fall 2023
MATH 1232 Single-Variable Calculus II	Spring 2023
MATH 1231 Single-Variable Calculus I	Fall 2022

Selected Guest Teaching

Georgetown University: Graph Theory	Spring 2026
Catholic University of America: Graph Theory, Advanced Graph Theory, Combinatorics	2025, 2026

Presentations & Conference Organization

Conference Organization

Organizer, AMS Special Session on Knots and Braids, I	October 3–4, 2026
AMS Fall Eastern Sectional Meeting, George Washington University	
Knots in Washington Organizer	Fall 2022 – Present
Organize the semiannual Knots in Washington research conference series.	

Research Presentations

Möbius Connections and Periodic Temperley-Lieb Representations	November 7–8, 2026
AMS Fall Western Sectional Meeting, Arizona State University, Tempe, AZ; Special Session on Inverse Problems	

- **Periodic Temperley-Lieb Algebras and Gram Determinants on the Möbius Band** October 3–4, 2026
AMS Fall Eastern Sectional Meeting, George Washington University; Special Session on Categorification, Low-Dimensional Topology, and Representation Theory (forthcoming)
- **Music Theory Mod n** April 24, 2026
GW Association for Women in Mathematics Lecture and Panel, Washington, DC
- **Gram Determinants of Type M_b & Representations of the Temperley–Lieb Algebra** (poster) April 15, 2026
CCAS Research Showcase, George Washington University, Washington, DC
- **Homology of Bol–Moufang Quasigroups** April 10, 2026
New York Combinatorics Seminar, Virtual invited talk
- **Gram Determinants of Type M_b** March 8, 2026
AMS Spring Western Sectional Meeting, Boise State University, Boise, ID; invited Special Session on Algebraic Structures in Knot Theory and 3-Dimensional Topology
- **Invariance Results for Bol–Moufang Homology** December 7, 2025
Knots in Washington 52, Washington, DC
- **Bol–Moufang Quasigroups Homology** October 26, 2025
AMS Virtual Fall Eastern Sectional Meeting; invited Special Session on Quantum Supergroups in Low-Dimensional Topology
- **Homology of Quasigroups of Bol–Moufang Type** October 18, 2025
AMS Fall Central Sectional Meeting, St. Louis, MO; invited Special Session on Inverse Problems
- **Invariance of Bol–Moufang Homology** October 8, 2025
Catholic University of America Mathematics Colloquium, invited talk
- **More Relations in Cubic Skein Modules** May 4, 2025
AMS Spring Western Sectional Meeting, California Polytechnic State University, San Luis Obispo, CA; invited Special Session on Knot Theory and Quantum Topology
- **Cubic Skein Modules of Rational and Pretzel Links** April 26, 2024
Distinguished Graduate Student Talk, Knots in Washington 49⁶³/₆₄
- **Two-Bridge Algorithm for Cubic Skein Modules** April 6, 2024
AMS Spring Eastern Sectional Meeting, Howard University; Special Session on Skein Modules in Low-Dimensional Topology
- **Fox Coloring Group and Alexander-Burau-Fox Module of Wheel Graphs** May 26, 2023
Graduate Student Conference in Algebra, Geometry, and Topology, Temple University
- **Relations in Cubic Skein Modules** May 6, 2023
AMS Spring Western Sectional Meeting, Fresno State University; Contributed Paper Session II

Professional Experience

Upward Bound Math Instructor Mathematics instructor for a federal TRIO college-bridge program serving low-income students in Washington, DC.	Summer 2023–2025
QSR Tutor Provided drop-in and individual mathematics tutoring, Hamilton College	Spring 2024
Teaching Assistant Hamilton College	Fall 2020

Awards & Honors

George Washington University

Washington, DC

Columbian Distinguished Fellowship

2026–2027

Funded by the Mary Hopkins Shepard Endowed Graduate Fellowship for Science

Graduate Student Teaching Prize in Mathematics

2026

Marvin Green Prize

2026

James H. Taylor Graduate Mathematics Prize

2025

Hamilton College

Clinton, NY

Honors in Mathematics

2022

Edward Huntington Memorial Mathematics Prize

2022

Madeleine Wild Bristol Scholarship

2022

Carter Family Prize Scholarship

2022