

Charlotte Aten

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Education

- 2017– **Mathematics PhD student**, *University of Rochester*, Rochester, NY.
Expected May 2022
- 2014–2017 **Bachelor of Science in Mathematics (Honors)**, *University of Rochester*, Rochester, NY.
- 2012–2014 **Associate of Science in Mathematics**, *Monroe Community College*, Rochester, NY.
Awarded with honors

Research Interests

My research interests skew combinatorial and I have an affinity for universal algebra. On the algebro-topological side of combinatorics I like to study graphs/complexes/manifolds manufactured from (quasi)groups and on the analytic side I am interested in applications of the theory of multi-linear forms to sum-product phenomena in additive combinatorics. In either case, representation theory is always relevant.

Publications and recent preprints

- Charlotte Aten and Alex Iosevich. “A multi-linear geometric estimate”. In: *arXiv e-prints* (Dec. 2021). arXiv: 2112.00810 [math.NT]
- Charlotte Aten and Semin Yoo. “Orientable smooth manifolds are essentially quasigroups”. In: *arXiv e-prints* (Oct. 2021). arXiv: 2110.05660 [math.RA]
- Charlotte Aten. “Multiplayer rock-paper-scissors”. In: *Algebra universalis* 81.3 (2020)
- Charlotte Aten. “Multiplayer Rock-Paper-Scissors”. In: *Algebras and Lattices in Hawai’i*. Ed. by Kira Adaricheva, William DeMeo, and Jennifer Hyndman. Apr. 2018, pp. 12–19
- C. Aten et al. “Tiling sets and spectral sets over finite fields”. In: *Journal of Functional Analysis* (Sept. 2015)

Talks

- 2022 **Panglobal Algebra and Logic Seminar (Spring)**, *University of Colorado at Boulder*.
Orientable smooth manifolds are essentially quasigroups
- 2021 **Virginia Tech Analysis and Mathematical Physics Seminar (Fall)**, *Virginia Tech*.
A multi-linear geometric estimate
- 2021 **Binghamton University’s Graduate Conference in Algebra and Topology**, *Binghamton University*.
Orientable smooth manifolds are essentially quasigroups
- 2021 **SUMS Math Talk**, *University of Rochester*.
My Hawai’ian Earring
- 2021 **New York Combinatorics Seminar (Spring)**, *The City University of New York*.
Multiplayer rock-paper-scissors
- 2021 **Rochester Combinatorics Seminar (Spring)**, *University of Rochester*.
Universal algebra gives universal approximation for neural nets

- 2021 **Panglobal Algebra and Logic Seminar (Spring)**, *University of Colorado at Boulder*.
Multiplayer rock-paper-scissors
- 2020 **Binghamton University's Graduate Conference in Algebra and Topology**, *Binghamton University*.
Multiplayer rock-paper-scissors
- 2020 **SUMS Math Talk**, *University of Rochester*.
A High School Algebra Problem
- 2019 **Graduate Student Seminar (Fall)**, *University of Rochester*.
More Multiplayer Rock-Paper-Scissors
- 2018 **Binghamton University's Graduate Conference in Algebra and Topology**, *Binghamton University*.
Topological Lattices and Book Spaces
- 2018 **Graduate Student Seminar (Fall)**, *University of Rochester*.
Classifying Topological Magmas
- 2018 **Algebras and Lattices in Hawai'i**, *University of Hawai'i at Manoa*.
Multiplayer Rock-Paper-Scissors
- 2018 **Graduate Student Seminar (Spring)**, *University of Rochester*.
Multiplayer Rock-Paper-Scissors
- 2017 **Binghamton University's Graduate Conference in Algebra and Topology**, *Binghamton University*.
Universal Algebra and Boolean Semilattices
- 2017 **Graduate Student Seminar (Fall)**, *University of Rochester*.
A Brief Introduction to Universal Algebra
- 2017 **Senior thesis presentation**, *University of Rochester*.
The Topology of Magmas
- 2017 **Nebraska Conference for Undergraduate Women in Mathematics**.
Poster: Relational Structures as Directed Hypergraphs
- 2016 **National Conference on Undergraduate Research**, *University of North Carolina at Asheville*.
The Topology of Magmas
- 2016 **National Conference for McNair Scholars**, *University of Maryland*.
Topological Algebra: On Viewing Operations as Simplicial Complexes
- 2015 **David T. Kearns Center Research Symposium**, *University of Rochester*.
Constructions of Geometric Objects Encoding Algebraic Structures
- 2014 **Scholars' Day**, *Monroe Community College*.
Division by Zero: Development of a Relevant Algebra with Historical Context
- 2013 **Math Awareness Month**, *Monroe Community College*.
An Introduction to Hyperspace with a Construction of the 4-Cube

Events Hosted

- 2019 **Pi Day**, *University of Rochester*.
Mathematical art exhibit and student poster session.
- 2014 **Math Awareness Month**, *Monroe Community College*.
Interactive Math Day

Other Conferences Attended

2017 **Joint Mathematics Meetings**, *Atlanta, GA.*

Honors and Awards

2017 **Provost's Fellowship**, *University of Rochester.*

Fellowship awarded to broaden the diversity of graduate students at the university.

2017 **Doris Ermine Smith Award**, *University of Rochester.*

Award given in recognition of students who show significant achievement in the areas of French and/or Mathematics.

2015 **McNair Scholar**, *University of Rochester.*

United States federal program which prepares underrepresented undergraduate students for doctoral studies.

2014 **Xerox STEM Scholarship**, *Monroe Community College.*

Scholarship created to support Monroe County residents who will pursue careers in STEM.

2013 **Jan Z. Wiranowski Renaissance Scholarship**, *Monroe Community College.*

Scholarship created to assist high-achieving students who will pursue careers in mathematics or a mathematics-related field.

Programming Languages and Other Technologies

Python programming language

L^AT_EX markup language

Linux operating system

network administration, shell scripting experience

SageMath mathematics software

Eclipse integrated development environment

Git version control software

Blender graphics software

experience scripting with Python

Teaching

Spring 2022 **Grader for MTH 240 Topology**, *University of Rochester.*

Fall 2021 **TA for MTH 208 Operations Research**, *University of Rochester.*

Summer 2021 **Instructor for MTH 165 Linear Algebra with Differential Equations**, *University of Rochester.*

Spring 2021 **Instructor for informal representation theory reading course**, *University of Rochester.*

Taught representation theory to undergraduate math student David Crncevic.

Spring 2021 **Workshop TA for MTH 161 Calculus IA**, *University of Rochester.*

Spring 2021 **Grader for MTH 248 Graph Theory**, *University of Rochester.*

Graded homework assignments.

Fall 2020 **Grader for MTH 165 Linear Algebra with Differential Equations**, *University of Rochester.*

Summer 2020 **Instructor for MTH 162 Calculus IIA**, *University of Rochester.*

Spring 2020 **Recitation TA for MTH 162 Calculus IIA**, *University of Rochester.*

Fall 2019 **Recitation TA for MTH 164 Multidimensional Calculus**, *University of Rochester.*

Spring 2019 **Grader for MTH 248 Graph Theory**, *University of Rochester.*

Graded homework assignments.

2014–2016 **Tutor**, *University of Rochester Center for Excellence in Teaching and Learning*.
Peer tutor for mathematics courses.

Outreach

Summer 2021 **Python instructor and project leader for Tripods NSF REU/Grad for All 2021**, *University of Rochester/Cornell University*.

Guided coding sessions and initiated an ongoing research project on a connection between neural nets and universal algebra.

Summer 2020 **Python instructor and Mentor for Tripods NSF REU/Grad for All 2020**, *University of Rochester/Cornell University*.

Guided coding sessions, wrote example code and exercises, and mentored undergraduates from underrepresented groups attending local colleges.

Summer 2018 **Teaching Assistant for Grad STEM for All**, *University of Rochester*.

Lectured, guided problem sessions, and mentored undergraduates from underrepresented groups attending local colleges.

Fall 2017 **Tutor for Upward Bound**, *University of Rochester Kearns Center*.

Volunteer tutor for underrepresented high school students.

Organizations

2021–2022 **outGRADS Treasurer**, *University of Rochester*.

outGRADS is a queer graduate student affinity organization founded in 2021.

2018–2022 **AMS Graduate Student Chapter President**, *University of Rochester*.

2013–2014 **Math Club President**, *Monroe Community College*.

2012–2013 **Math Club Treasurer**, *Monroe Community College*.