Michael Cerchia **Emory University** **October 16, 2023**

CONTACT INFORMATION

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U.S. citizen

RESEARCH INTERESTS

Broad: Number Theory, Arithmetic Geometry, Algebraic Geometry.
Specific: Arithmetic of Varieties, Modular Curves, Stacks, Galois Representations.

APPOINTMENTS

Emory University
Graduate Research Assistant (2019 - present)

EDUCATION

Emory University, Atlanta, Georgia USA
Ph.D., Mathematics, May 2024 (Expected)
Dissertation Topic: "The Canonical Ring of Moduli of Abelian Varieties"
Adviser: David Zureick-Brown (Amherst)

Wake Forest University, Winston-Salem, North Carolina USA
M.A., Mathematics, May 2019
Thesis Topic: "Classifying the Image of the Arboreal Galois Representation"
Adviser: Jeremy Rouse (Wake Forest)

SUNY Geneseo, Geneseo, New York USA
B.A., Mathematics and English Literature, May, 2012

Budapest Semesters in Mathematics, Budapest, Hungary
Study abroad, Fall 2010

HONORS AND AWARDS

(Spring 2019) Best Graduating Student in Mathematics (Wake Forest)

PUBLICATIONS (PEER REVIEWED JOURNAL ARTICLES)

1. **Uniform bounds on the image of the arboreal Galois representations attached to non-CM elliptic curves**; with Jeremy Rouse; *Proceedings of the American Mathematical Society* 2021, no. 2, 583-589. arxiv

PREPRINTS

2. **The canonical ring of the moduli space of abelian varieties for low genus.** (In Progress).
3. **The section ring of stacky genus 1 curves.** (In Progress). With Jesse Franklin and Evan O'Dorney
4. **Sporadic Quartic Torsion.** (In Progress). With Alexis Newton

PUBLICATIONS (THESIS)

5. **Classifying the Image of the Arboreal Galois Representation**; 2019; Michael Cerchia; Wake Forest M.A. thesis; 31 pages. link

TEACHING (EMORY)

Emory University, Atlanta, GA
Graduate Teaching Assistant.

Sole Instructor (2 courses)

Spring 2022	Calculus I	Math 111
Fall 2021	Calculus I	Math 111

Teaching Assistant (5 courses) *Wrote quizzes, graded quizzes and exams, taught weekly one hour lab section, and held office hours.*

Spring 2021	Combinatorics	Math 330
Fall 2020	Linear Algebra	Math 221
Fall 2020	Number Theory	Math 328 (Grader)
Spring 2020	Mathematical Statistics II	Math 362
Spring 2019	Mathematical Statistics I	Math 361

Teaching (Wake Forest)

Wake Forest University, Winston-Salem, NC
Graduate Teaching Assistant.

Teaching Assistant (6 courses) *Led weekly three hour discussion and problem solving session, wrote quizzes, graded quizzes and exams, and held office hours.*

Spring 2019	Modern Algebra I	Math 321
Fall 2018	Modern Algebra I	Math 321
Summer 2018	Linear Algebra I.	Math 121
Summer 2018	Calculus with Analytic Geometry II.	Math 112
Spring 2018	Linear Algebra I.	Math 321
Fall 2017	Multivariable Calculus	Math 113

Teaching (Other)

Emory Math Circle, Atlanta, Georgia USA
Instructor. Enrichment program for advanced local middle and high school students. Designed and taught courses in number theory, combinatorics, and computer science.

Spring 2021	High School A/B Assistant
Fall 2020	High School A/B Assistant
Spring 2020	High School A Instructor
Fall 2019	High School A Instructor

Mathnasium, Brooklyn, New York USA (2016-2017)
Instructor. Tutored middle and high school students in the standard NYS curriculum.

Industry Activities

MinedXai Dayton, Ohio USA (Summer 2023)
Intern. Used techniques from topological data analysis to develop a forex forecasting model.

Organization

(Spring 2022)	Automorphic Forms Student Seminar
(Fall 2022)	Modular Forms Student Seminar

Conference Talks

(Spring 2024) **The section ring of a stacky genus** 1 **curve**. Invited talk at the JMM Special Section: Explicit Computations with Stacks

(Spring 2020) **Classifying the Image of the Arboreal Galois Representation**. Contributed talk at the JMM.

(Fall 2019) **Classifying the Image of the Arboreal Galois Representation**. PANTS (Palmetto Number Theory Series). Contributed talk

Student Seminar Talks

(Spring 2022) **Formal Immersions**. Mazur Seminar. Emory University (Expository)

(Fall 2021) **Introduction to Modular Forms**. Seminar on Modular Forms. Emory University (Expository)

(Spring 2021) **Geometric Invariant Theory**. RANT. Emory University (Expository)

(Fall 2020) **Introduction to Modular Curve**. RANT. Emory University (Expository)

(Fall 2020) **Infinitude of supersingular primes for elliptic curves over** $\mathbb{Q}$. RANT. Emory

University (Expository)
(Spring 2020) **An Introduction to Arithmetic Dynamics**. RANT. Emory University (Expository)
(Fall 2019) **The Jacobian**. Nonabelian Chabauty and Other Stuff (NACHOS). Emory University (Expository)
(Spring 2019) **Galois Representations Attached to Elliptic Curves**. Wake Forest Summer Research Seminar. Wake Forest University

Software Skills

Proficient in Python and Magma.

References

David Zureick-Brown
Amherst College
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John Voight
Dartmouth College
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Brooke Ullery
Emory University
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Juan Villeta-Garcia (Teaching)
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