

CHRISTOPHER KEYES

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W431 Mathematics and Science Center

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[Website](#)

RESEARCH INTERESTS

Number theory, arithmetic statistics, arithmetic geometry.

EDUCATION

Emory University

- Ph.D., Mathematics (expected graduation: 2023).
- M.S., Mathematics (2021).
- Advisor: David Zureick-Brown.

Tufts University

- B.S., Mathematics and Chemical Engineering, *Summa Cum Laude* (2018).
- Senior honors thesis: *Growth of points on hyperelliptic curves*, Highest Honors.

PUBLICATIONS AND PREPRINTS

Preprints

5. **On the density of locally soluble superelliptic curves** (joint with Lea Beneish). Submitted. ([preprint](#))
4. **Fields generated by points on superelliptic curves** (joint with Lea Beneish). Submitted. ([preprint](#))

Publications

3. **Mertens' theorem for Chebotarev sets** (joint with Santiago Arango-Piñeros and Daniel Keliher). Accepted for publication in *International Journal of Number Theory*. ([preprint](#))
2. **Growth of points on hyperelliptic curves**. Accepted for publication in *Journal de Théorie des Nombres de Bordeaux*. ([preprint](#))
1. **Bounding the number of arithmetical structures on graphs** (joint with Tomer Reiter). *Discrete Mathematics*, Volume 344, Issue 9, 2021. ([journal](#), [preprint](#))

INVITED TALKS

4. *On the proportion of everywhere locally soluble superelliptic curves*. Secret AGeNTS, Tufts University (held virtually), November 18, 2021.

¹Updated February 8, 2022

3. *Chip-firing games and arithmetical structures on graphs*. WashU Undergraduate Mathematics Seminar, Washington University in St. Louis (held virtually), November 9, 2021.
2. *Fields generated by points on superelliptic curves* (joint talk with Lea Beneish). UW Number Theory Seminar, University of Washington (held virtually), June 8, 2021.
1. *Counting number fields: problems and progress*. WashU Undergraduate Mathematics Seminar, Washington University in St. Louis (held virtually), January 29, 2021.

CONTRIBUTED TALKS

7. *On the proportion of everywhere locally soluble superelliptic curves*. Upstate Number Theory Conference, Union College, October 23, 2021.
6. *Fields generated by points on superelliptic curves*. Young Researchers in Algebraic Number Theory (Y-RANT), University of Bristol (held virtually), August 19, 2021.
5. *Mertens' product theorem for primes in Chebotarev sets*. Front Range Number Theory Day, held virtually, April 24, 2021.
4. *An upper bound for the number of arithmetical structures on a graph*. Mid-Atlantic Seminar on Numbers (MASON) V, held virtually, March 27, 2021.
3. *An upper bound for the number of arithmetical structures on a graph*. Palmetto Joint Arithmetic, Modularity, and Analysis Series (PAJAMAS), University of South Carolina (held virtually), December 6, 2020.
2. *Growth of points on hyperelliptic curves*. Tufts Undergraduate Research Symposium, Tufts University, May 3, 2018.
1. *Growth of points on hyperelliptic curves*. Palmetto Number Theory Series (PANTS) XXVIII, University of Tennessee Knoxville, September 17, 2017.

TEACHING EXPERIENCE

Emory University

- Instructor, Math 111 Calculus I (Fall 2020, Spring 2021).
- Teaching Assistant, Math 221 Linear Algebra (Fall 2019, Spring 2020).
- Grader, Math 250 Foundations of Mathematics (Fall 2018, Spring 2019, Fall 2019).
- Grader, Math 212 Differential Equations (Spring 2019).
- Grader, Math 328 Number Theory (Fall 2018).
- Tutor, weekly calculus workshops (Fall 2018, Spring 2019).

Tufts University

- Tutor, various courses including mathematical modeling, linear algebra, discrete mathematics, differential equations, calculus I - III (Fall 2017 – Spring 2018).

ORGANIZATION

Seminars

- Co-organizer of *RANT*, Emory's weekly graduate student seminar in algebra and number theory, with Alexis Newton (Fall 2020 – present). Seminar [website](#).
- Co-organizer of *Geometric Arithmetic Statistics at Emory Seminar (GASES)*, with Santiago Arango Piñeros and David Zureick-Brown (Spring 2021). Seminar [website](#).
- Co-organizer of *Emory Arithmetic Statistics Student Seminar (EARSSS)*, with Santiago Arango Piñeros and David Zureick-Brown (Fall 2020). Seminar [website](#).

Emory Math Directed Reading Program

Created and organized a directed reading program matching undergraduate students with graduate students to read and discuss a mathematical text (Spring 2021 – present). See this [webpage](#).

Topics mentored:

- *Sports analytics*, Ezra Arovav (Spring 2022).
- *Elliptic curves*, 3 students (Fall 2021).
- *p-adic numbers*, 4 students (Spring 2021).

OUTREACH

- Staff writer, [AMS graduate student blog](#) (Fall 2021).
- Instructor, Emory Math Circle, High School Level A (Fall 2021).
- Director, Emory Emory Math Circle Week of Mathematical Exploration (Summer 2021).
- Instructor, Emory Math Circle, Middle School Level C (Spring 2019 – Spring 2020).
- Assistant, Emory Math Circle Week of Mathematical Exploration (Summer 2019, Summer 2020).
- Instructor, Emory Math Circle, Middle School Level A (Fall 2018).
- Fellow, Tufts STOMP (Spring 2015 – Spring 2017).

AWARDS

- Honorable Mention, NSF Graduate Research Fellowship (2018).
- Ralph S. Kaye Memorial Prize, Tufts University Math Department (2018).
- Benjamin G. Brown Scholarship, Tufts University (2018).
- Tufts Summer Scholars, Tufts University (2017).
- Class of 1898 Prize, Tufts University (2017).
- Stern Term Scholarship, Tufts University (2016).
- Karno Dean's Award for Academic Excellence and Leadership, Tufts University (2016).
- National Merit Scholarship (2014).

COMPUTING

Familiar with Sage, Magma, C++, MATLAB.