

MICHAEL ALLEN

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Employment

Postdoctoral Researcher Louisiana State University	2022-Current
Graduate Teaching Assistant Oregon State University	2016-2022

Education

Doctorate
Ph.D., Mathematics Spring 2022
Oregon State University
Supervisor: Holly Swisher

Masters
M.S., Mathematics Spring 2018
Oregon State University

Bachelors
B.S., Mathematics Spring 2015
University of Idaho

Research Interests

Modular Forms
Hypergeometric Functions
Elliptic Curves and Abelian Varieties
Arithmetic Statistics

Publications

7. (With B. Grove, L. Long, F-T. Tu) *The Explicit Hypergeometric Modularity Method*, in preparation.
6. (With L. Long), *Hypergeometric functions through the arithmetic kaleidoscope*, in preparation.

5. (With R. Bell, R. Lemke Oliver, A. Serrano López, and T.A. Wong), *Lower bounds for the number of fields generated by algebraic points on plane curves*, in preparation.
4. (With O. Beckwith and V. Sharma) *Holomorphic projection for sesquiharmonic Maass forms*, in preparation.
3. *On some hypergeometric supercongruence conjectures of Long*, Ramanujan Journal (2023).
<https://doi.org/10.1007/s11139-022-00665-2>
2. *Existence of η -quotients for squarefree levels*, Research in Number Theory, 6, 34 (2020).
1. (With N. Anderson, A. Hamakiotes, B. Oltsik, and H. Swisher) *Eta-quotients of prime or semiprime levels and elliptic curves*, Involve, 13, 5 (2020), 879–900.

Presentations

- Research talks
29. **36th Automorphic Forms Workshop** May 21-24, 2024
Hypergeometric Functions and Explicit Results in Modularity
 Oklahoma State University — Stillwater, OK
 28. **The Web of Modularity** February 23, 2024
Hypergeometric Functions and Explicit Results in Modularity
 Tulane University — New Orleans, LA
 27. **University of Idaho Algebra and Number Theory Seminar** February 15, 2024
Modularity and hypergeometric supercongruences
 University of Idaho — Moscow, ID
 26. **West Coast Number Theory** December 18, 2023
Counting number fields generated by plane curves
 Nevada State University — Henderson, NV
 25. **Palmetto Area Number Theory Seminar XXXVII** December 9, 2023
Hypergeometric supercongruences
 University of Georgia — Athens, GA
 24. **University of Idaho Mathematics Colloquium** October 26, 2023
Counting number fields generated by plane curves
 University of Idaho — Moscow, ID
 23. **AMS Southeastern Sectional Meeting—Special Session on Experimental Mathematics in Number Theory and Combinatorics** October 14, 2023
Holomorphic projection of sesquiharmonic Maass forms and class numbers of real quadratic fields
 University of South Alabama — Mobile, AL
 22. **Oregon State Number Theory Seminar** October 3, 2023
Sesquiharmonic Maass forms and class numbers of real quadratic fields
 Oregon State University — Corvallis, OR
 21. **35th Automorphic Forms Workshop** May 23, 2023
Holomorphic projection of sesquiharmonic Maass forms
 Louisiana State University — Baton Rouge, LA

20. **SPECTRA Survey of Mathematics** May 21, 2023
Counting number fields generated by plane curves
 University of Kentucky — Lexington, KY
19. **JMM 2023—Special Session on Modular Forms, Hypergeometric Functions, Character Sums and Galois Representations** January 5, 2023
Some modular supercongruences
 Boston, MA
18. **Tufts Algebra, Geometry, and Number Theory Seminar** October 20, 2022
Hypergeometric supercongruences
 Tufts University — Medford, MA
17. **LSU Number Theory and Algebra Seminar** September 6, 2022
On some supercongruence conjectures of Long
 Louisiana State University — Baton Rouge, LA
16. **Geometry and Arithmetic of Calabi-Yau Threefolds** July 21, 2022
On Some Hypergeometric Supercongruence Conjectures of Long
 Bhaskaracharya Pratishthana — Pune, India
15. **JMM 2022—Special Session on Quadratic Forms, Modularity, and Theta Functions** April 7, 2022
On some supercongruence conjectures of Long
 Zoom
14. **JMM 2022, Special Session on Rethinking Number Theory** April 7, 2022
How do points on plane curves generate fields? Let me count the ways.
 Zoom
13. **34th Automorphic Forms Workshop** March 17, 2022
On some hypergeometric supercongruence conjectures of Long
 Zoom
12. **Oregon Number Theory Days** February 19, 2022
p-adic Hypergeometric Series and Modular Forms
 Oregon State University — Corvallis, OR
11. **Oregon State University Number Theory Seminar** November 24, 2020
Fields generated by plane curves
 Oregon State University — Corvallis, OR
10. **Oregon State University REU Colloquium** July 20, 2020
The Langlands Program
 Oregon State University — Corvallis, OR
9. **Oregon State University Number Theory Seminar** May 26, 2020
On some hypergeometric supercongruence conjectures of Long
 Oregon State University — Corvallis, OR
8. **Oregon State University Number Theory Seminar** November 12, 2019
Hypergeometric supercongruences involving Fourier coefficients of modular forms
 Oregon State University — Corvallis, OR
7. **AMS Fall Southeastern Sectional Meeting** November 3, 2019
Existence of η -quotients of squarefree levels
 University of Florida — Gainesville, FL
6. **Oregon State University Graduate Student Seminar** August 6th, 2019
Hypergeometric Functions and Langlands Correspondences

Oregon State University — Corvallis, OR

5. **Oregon State University REU Colloquium** July 19, 2019
Galois Representations
Oregon State University — Corvallis, OR
4. **Southern Regional Number Theory Conference** April 13, 2019
Existence of η -quotients of squarefree levels
Louisiana State University — Baton Rouge, LA
3. **33rd Automorphic Forms Workshop** March 8, 2019
Existence of η -quotients of squarefree levels
Duquesne University — Pittsburgh, PA
2. **Oregon State University Number Theory Seminar** February 5th, 2019
Galois Representations Associated to Elliptic Curves and Modular Forms
Oregon State University — Corvallis, OR
1. **Oregon State University Number Theory Seminar** October 30th, 2018
 η -quotients of squarefree level and elliptic curves
Oregon State University — Corvallis, OR

Introductory lectures and pre-talks.....

3. **35th Automorphic Forms Workshop** May 22, 2023
Introductory lecture on elliptic curves
Louisiana State University — Baton Rouge, LA
2. **Bayou Arithmetic Research Days** April 14, 2023
Pre-talk on spectral theory of real-analytic modular forms
Tulane University — New Orleans, LA
1. **Bayou Arithmetic Research Days** November 11, 2022
Pre-talk on elliptic curves and sporadic torsion
Louisiana State University — Baton Rouge, LA

Poster Presentations.....

1. **Oregon Number Theory Days** February 16, 2019
Existence of η -quotients for squarefree levels
Oregon State University

Other Conferences and Workshops Attended

13. **Oregon Number Theory Days** October 2nd, 2021
Portland State University

12. **Graduates Achieving Inclusion Now Virtual Conference** September 26–October 17, 2021
11. **Rethinking Number Theory** October 5–18, 2020
Online research/equity workshop held over Zoom during the COVID-19 pandemic. Currently working on a project with Renee Bell, Robert Lemke Oliver, Allechar Serrano López, and Tian An Wong.
10. **Oregon Number Theory Days** February 20, 2020
Oregon State University
9. **Oregon Number Theory Days** November 23, 2019
University of Oregon
8. **Analytic and Combinatorial Number Theory: The Legacy of Ramanujan** June 6–9, 2019
University of Illinois at Urbana-Champaign — Urbana-Champaign, IL
7. **Oregon Number Theory Days** June 1, 2019
Portland State University
6. **Oregon Number Theory Days** February 16, 2019
Oregon State University
5. **Connecticut Summer School in Number Theory** May 28–June 3, 2018
University of Connecticut — Storrs, CT
4. **Oregon Number Theory Days** May 19, 2018
Portland State University
3. **AMS Spring Western Sectional** April 14–15, 2018
Portland State University — Portland, OR
2. **Oregon Number Theory Days** January 27, 2018
Oregon State University
1. **Oregon Number Theory Days** October 21, 2017
University of Oregon

Service and Outreach

Outreach

Louisiana State University Laboratory School Math Club October 3, 2023
Led an activity on Benford’s Law and talked to high school students about what it actually means to be a research mathematician.

Diversity and Equity

College of Science Multidisciplinary Antiracism Coalition (CoSMAC): Co-founding member
June 2020–2022
Student organization co-founded by graduate students across departments in the College of Science to uproot systemic racism in science fields and establish a culture of antiracism by advocating for the adoption of antiracist policies, practices, and actions at Oregon State University’s College of Science.

Virtual Town Hall on Black Experiences: Co-organizer and Facilitator October 8, 2020
Virtual town hall for members of the Oregon State University College of Science to listen to Black students’ experiences in the College in a push towards achieving equitable educational outcomes, increasing support in and outside classrooms, and ensuring the academic success of students. Co-organized alongside other

members of CoSMAC, the College of Science Dean's Office, and Black staff members from the OSU Educational Opportunities Program and the Lonnie B. Harris Black Cultural Center.

Conferences Organized

10th Southern Regional Number Theory Conference March 9-11, 2024
Louisiana State University — Baton Rouge, LA

9th Southern Regional Number Theory Conference March 11-12 2023
Louisiana State University — Baton Rouge, LA

Oregon Number Theory Days — Student and Recent PhD Showcase February 19-20 2022
Oregon State University — Corvallis, OR

Panels

General panel discussion May 22, 2023
35th Automorphic Forms Workshop
Louisiana State University — Baton Rouge, LA

Applying for jobs/funding February 20, 2022
Oregon Number Theory Days
Oregon State University — Corvallis, OR

Graduate student teaching panel 2018/2019
Teaching Assistant Preparatory Workshop
Oregon State University — Corvallis, OR

Reviews/Referees

Bulletin of the Australian Mathematical Society
MathSciNet

Teaching Experience

Instructor of Record

Louisiana State University

- MATH 7230 - Modular Forms Spring 2024
- MATH 2090 - Elementary Differential Equations and Linear Algebra Fall 2023
- MATH 1551 - Honors Calculus I Fall 2022

Oregon State University

- MTH 607 - Qualifying exam prep seminar Winter/Summer 2020/Summer 2021
Seminar designed to help prepare early graduate students for qualifying exams in both Real Analysis and Linear Algebra
- MTH 111 - College Algebra Fall 2019

- Boot Camp for Incoming Mathematics Graduate Students Summer 2019/Summer 2021
- MTH 341 - Linear Algebra I Summer 2019
- MTH 241 - Calculus for Management and Social Science Summer 2017

Teaching Assistant.....

Oregon State University

- MTH 343 - Introduction to Modern Algebra Fall 2020/Winter 2021/Spring 2021
Fall 2021/Winter 2022
- MTH 341 - Linear Algebra I Spring 2020
- MTH 306 - Matrix and power series methods Spring 2018
- MTH 256 - Applied differential equations Fall 2018
- MTH 255 - Vector calculus II Spring 2019
- MTH 254 - Vector calculus I Winter 2018
- MTH 252 - Integral calculus Fall 2017/Winter 2019
- MTH 251 - Differential calculus Spring 2017
- MTH 112 - Elementary functions Winter 2017
- MTH 105 - Intro to contemporary math Fall 2016

Awards and Honors

- Outstanding Graduate Student Talk** March 2022
34th Automorphic Forms Workshop
- AMS Grad Student Travel Grant to the Joint Mathematics Meetings** 2022
American Mathematical Society
- Graduate Student Excellence Award** 2021
Oregon State University
- Outstanding Performance in Coursework Award** 2019
Oregon State University
- Graduate Student Award for Excellence in Qualifying Exams** 2018
Oregon State University

Memberships

American Mathematical Society

Computer Proficiencies

Magma, Maple, Sage, Python, C++