MANAMI ROY

CONTACT INFORMATION

Department of Mathematics
Lafayette College
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EMPLOYMENT

Assistant Professor　　　　　　　　　　　　　　　　　　　　　　*August 2023 - present*
Department of Mathematics, Lafayette College

Peter M. Curran Visiting Assistant Professor　　　　　　　*August 2019 - August 2023*
Department of Mathematics, Fordham University

EDUCATION

University of Oklahoma, Norman, OK, USA　　　　　　　　　　　　　　*2014-2019*
Ph.D. in Mathematics
Advisor: Dr. Ralf Schmidt

IISER Kolkata, Mohanpur, Nadia, West Bengal, India　　　　　　　　*2011-2014*
M.S. of the Integrated PhD. Program in Mathematics
Advisor: Dr. Saugata Bandyopadhyay and Dr. Kaneenika Sinha

Bethune College, University of Calcutta, Kolkata, India　　　　　　*2009 - 2011*
B.Sc.(Honors) in Mathematics

RESEARCH INTEREST

Number theory and arithmetic geometry; broadly comes under the Langlands Program. Specifically, I am interested in automorphic forms, local-global representation theory, elliptic curves, L-functions and classical modular forms. Recently, I have been working on some projects in partition theory, hypergeometric series, and computational number theory.

PUBLICATION

1. *Dimension formulas for Siegel modular forms of level* 4, with Ralf Schmidt and Shaoyun Yi, and an appendix by Cris Poor and David S. Yuen, Mathematika **69** (2023), no. 3, 795-840. DOI: https://doi.org/10.1112/mtk.12207.

2. *The completed standard L-function of modular forms on* G_2, with Fatma Çiçek, Giuliana Davidoff, Sarah Dijols, Trajan Hammonds, and Aaron Pollack, Mathematische Zeitschrift **302** (2022), 483-517, DOI: https://doi.org/10.1007/s00209-022-03067-8.

3. *Representations attached to elliptic curves with a non-trivial odd torsion point*, with Alexander J. Barrios, Bulletin of the London Mathematical Society **54** (2022), 1846-1861, DOI: 10.1112/blms.12660.

4. *Local Data of Rational Elliptic Curves with non-Trivial Torsion*, with Alexander J. Barrios, Pacific Journal of Mathematics **318** (2022), no.1, 1-42, DOI: https://doi.org/10.2140/pjm.2022.318.1.

5. *Congruences for dimensions of spaces of Siegel cusp forms and 4-core partitions*, with Chiranjit Ray and Shaoyun Yi, The Ramanujan Journal **58**, 1011-1023 (2022), DOI: 10.1007/s11139-021-00481-0.

6. *Paramodular forms coming from elliptic curves*, J. Number Theory **233** (2022), 126-157, DOI: 10.1016/j.jnt.2021.06.007.

7. *On counting cuspidal automorphic representations for GSp(4)*, with Ralf Schmidt and Shaoyun Yi), Forum Mathematicum **33** (2021), no. 3, 821-843, DOI: 10.1515/forum-2020-0313.

8. *Level of Siegel modular forms constructed via* sym^3 *lifting*, Automorphic forms and related topics, 225227, Contemp. Math., **732** (2019), 225-227, Amer. Math. Soc., DOI: 10.1090/conm/732/14798.

9. *Elliptic curves and paramodular forms*, University of Oklahoma doctoral dissertation, 2019.

PREPRINTS

10. *Classical and adelic Eisenstein series*, with Ralf Schmidt and Shaoyun Yi, arXiv preprint (https://arxiv.org/abs/2109.07649), 38 pages, 2021.

11. *Generalized Ramanujan-Sato Series Arising from Modular Forms*, with Angelica Babei, Lea Beneish, Holly Swisher, Bella Tobin, and Fang-Ting Tu, arXiv preprint (https://arxiv.org/abs/2202.13253), 33 pages, 2022.

12. *Prime isogenous discriminant twins over number fields*, with Alexander J. Barrios, Alyson Deines, Maila Hallare, and Piper H, 17 pages, 2022, Preprint available on request.

13. *Creating a database of finite groups*, with Lewis Combes, John W. Jones, Jennifer Paulhus, David Roe, and Sam Schiavone, 25 pages, 2023, Preprint available on request.

COMPUTATIONAL PROJECT

Database for Groups, L-functions and Modular Forms Database (LMFDB), June 2020-present

SELECTED TEACHING EXPERIENCE

Fordham Univeristy
as Primary Instructor and Course Organizer

Finite Mathematics	Math 1100	Spring 2022
Math for Business Finite	Math 1108	Fall 2020, Spring 2022
Calculus I	Math 1206	Fall 2019, 2021, 2022
Calculus II	Math 1207	Summer 2020, 2021
Multivariable Calculus II	Math 2005	Spring 2020
Linear Algebra I	Math 2006	Spring 2021, 2022
Abstract Algebra I	Math 3005	Fall 2020, 2021

University of Oklahoma
as Primary Instructor

Trigonometry and Precalculus	Math 1523	Fall 2017, Spring 2018
College Algebra	Math 1503	Summer 2017

as Teaching Assistant

Discrete Mathematics	Fall 2018
Differential and Integral Calculus II	Spring 2017
Calculus and Analytic Geometry I	Fall 2016, Summer 2017
Mathematics Capstone course on Unsolved Problems in Mathematics	Spring 2015
Calculus and Analytic Geometry II	Fall 2015

as grader and tutor

· I have graded many different courses so far, for example, advanced calculus, modern geometry, and differential equations. I was a tutor in the Math Center at the University of Oklahoma during 2014-2019,

NOTABLE TEACHING ACTIVITIES

- Helped reforming the Math for Business Finite course as a coordinated course at Fordham University

- In my online Abstract Algebra class, I have used Gathertown online platform to create an interactive group work environment. It created balance between lecture-based classes and "flipped classroom".

- I have taught Trigonometry and Precalculus course in an active inquiry-based learning setting, where class time was spent volleying between short lectures and group work.

- I have take a few courses of RUME (Research in Undergraduate Mathematics Education) courses in University of Oklahoma which have been helpful to identify a student's perspective in a class.

- I have mentored for undergraduate directed reading program in University of Oklahoma.

- In the course Mathematics Capstone course on Unsolved Problems in Mathematics, I helped students with group work, projects, coding in Sage.

PROJECT LEADERSHIP

Isogenous Discriminant Twins over Number Fields*   March 21-26, 2023

- co-leading of a project with Alyson Deines.
- This project is a part of the collaborative research workshop Women in Number Theory 6.

Elliptic curves with non-trivial isogeny   July 2021-present

- co-leading a project with Alexander Barrios.
- six-person group (an undergraduate student, a graduate student and four postdocs) project started at RNT: Rethinking Number Theory 2, a collaborative research workshop.

GRANTS

AMS-Simons Travel Grant   2022-2024

- A $5,000 grant to be used for research-related travel.

American Institute of Mathematics (AIM) SQuaRE   2022-2025

- Project Title: Weight Three Paramodular Forms, (with Cris Poor, Jerry Shurman, and Dave Yuen).

American Institute of Mathematics (AIM) SQuaRE   2023-2026

- Project Title: New Directions in Quaternionic modular forms, (with Lars Kleinemeier, Jennifer Johnson Leung, Finley Mcglade, Isabella Negrini, and Aaron Pollack).

HONORS AND AWARDS

- *Association for Women in Mathematics travel grant* to present at AWM JMM Graduate Student Poster Session 2019

- *American Mathematical Society Travel Grant $500 Travel Grant* to attend JMM 2019.

- *MGSA Good Mentor Award*, University of Oklahoma, 2019

- *Best Poster Award* at TORA X, University of North Texas 2019

- *Department of Mathematics Graduate Fellowship*, University of Oklahoma, 2015 - 2019

- *Harold Huneke Graduate Scholarship*, University of Oklahoma, 2016

- *Richard V. Andree Memorial Scholarship*, University of Oklahoma, 2015

- *Inspire Fellowship* for PhD, India, 2013

- *CSIR National Eligibility Test (NET) for JRF*, India, 2014

- *Graduate Aptitude Test in Engineering (GATE)*, 2014

- M.Sc. rank at IISER, Kolkata in Mathematics: *First*, 2014

- B.Sc. rank all over the University of Calcutta in Mathematics: *Third*, 2011

INVITED TALKS

Dimensions for the spaces of Siegel cusp forms of Klingen level 4 Explicit Methods for Modularity Session	Apr 12, 2022
The functional equation for completed standard L-function of modular forms on G_2, AMS Special Session on Rethinking Number Theory Joint Mathematics Meetings 2022	Apr 7, 2022
Tamagawa numbers for rational elliptic curves with non-trivial torsion AMS Special Session on A Showcase of Number Theory at Undergraduate Institutions Joint Mathematics Meetings 2022	Apr 6, 2022
Dimensions for the spaces of Siegel cusp forms of level 4 International Seminar on Automorphic Forms	Dec 7, 2021
Counting cuspidal automorphic representations of GSp(4) and *dimensions of Siegel cusp forms*, Johns Hopkins Number Theory Seminar	Nov 17, 2021
Congruences for dimensions of spaces of Siegel cusp forms and 4-core partitions Oregon State University Number Theory Seminar	Nov 2, 2021
Elliptic curves and modularity PRiME (Pomona Research in Mathematics Experience)	Jul 30, 2021
Counting cuspidal automorphic representations of GSp(4) Queen Mary University of London Algebra and Number Theory Seminar	Mar 12, 2021
Counting cuspidal automorphic representations of GSp(4) *and its application* The Ohio State University Number Theory Seminar	Feb 15, 2021
Local data of rational elliptic curves with non-trivial torsion Number Theory, Cryptography, and Coding Theory Seminar, Clemson University	Jan 25, 2021
An equidistribution result for cuspidal automorphic representations of GSp(4)	Jan 22, 2021

Number Theory Seminar, Queen's University

Challenges and usefulness of creating a database of groups in LMFDB Dec 8, 2020
VaNTAGe Math

An equidistribution theorem for automorphic representations of GSp(4). Nov 3, 2020
Algebra and Number Theory Seminar, Louisiana State University

On counting automorphic representations and its connection to Oct 23, 2020
an equidistribution theorem for GSp(4)
Algebra Seminar, University of North Texas

Local representations attached to rational elliptic curves with Jun 2, 2020
non-trivial torsion subgroups
Workshop on Arithmetic Geometry, Number theory and Computation, ICERM

Paramodular forms coming from elliptic curves Oct 11, 2019
Study group in number theory, the Gradute Center, CUNY

Paramodular forms coming from elliptic curves Mar 15, 2019
ISI, Kolkata, India

Paramodular forms coming from elliptic curves Mar 8, 2019
IISER, Pune, India

Level of Siegel modular forms of degree 2 coming from the sym^3 *lifting* Apr 3, 2017
Clemson University

An introduction to the principle of functoriality Apr 3, 2017
Clemson University

Level of Siegel modular forms constructed via sym^3 *lifting* Nov 5, 2016
Algebra Symposium, University of North Texas

CONFERENCE TALKS

Tamagawa numbers and torsion for rational elliptic curves Oct 23, 2021
Upstate Number Theory Conference

Local data for rational elliptic curves with non-trivial torsion Oct 3, 2021
Maine-Qubec Number Theory Conference

Rational elliptic curves with non-trivial torsion Sep 26, 2021
PAJAMAS III

On local data of rational elliptic curves with non-trivial torsion Sep 26, 2020
Madison Moduli Weekend, University of Wisconsin-Madison

Local representations attached to elliptic curves Nov 2, 2019
MAAIM, Emory University.

Paramodular forms coming from elliptic curves TORA X, University of North Texas.	Apr 6, 2019
Elliptic Curves and Paramodular Forms AMS Contributed Paper Session on Number Theory, III Joint Mathematics Meetings	Jan 18, 2019
Paramodular forms coming from elliptic curves using sym^3 lifting TORA IX, University of Oklahoma.	Apr 7, 2018
An introduction to my research interest UNCG Summer School in Computational Number Theory.	May 22, 2017
Level of Siegel modular forms constructed via sym^3 lifting 31st Automorphic Forms Workshop East Tennessee State University.	Mar 7, 2017
sym^3 and Siegel modular forms Building Bridges 3rd EU/US Workshop on Automorphic Forms and Related Topics, University of Sarajevo.	Jul 21, 2016

OTHER SEMINAR TALKS

On some equidistribution theorems Fordham Math Seminar, Fordham University.	Nov 5, 2020
Local representations attached to rational elliptic curves with non-trivial torsion subgroups Fordham Math Seminar, Fordham University.	Mar 26, 2020
Paramodular forms coming from elliptic curves Algebra and Representation Theory Seminar, University of Oklahoma.	Nov 16, 2018
Paramodular forms coming from elliptic curves via sym^3 lifting Communicating Mathematics Effectively, University of Washington.	Jun 21, 2018
Global and local fields Student Algebra Seminar, University of Oklahoma.	Sep 14, 2017
Group cohomology via projective resolutions Student Algebra Seminar, University of Oklahoma.	Feb 24, 2017
Group cohomology II Student Algebra Seminar, University of Oklahoma.	Feb 17, 2017
The principle of functoriality Algebra and Representation Theory Seminar, University of Oklahoma.	May 6, 2016

Functoriality for GL(n)	Apr 5, 2016
Student Algebra Seminar, University of Oklahoma.	
Local Langlands correspondence for GL(n)	Mar 29, 2016
Student Algebra Seminar, University of Oklahoma.	
Algebraic varieties	Oct 29, 2015
Student Algebra Seminar, University of Oklahoma.	
Representable functors	Oct 15, 2015
Category Theory Seminar, University of Oklahoma.	
A proof of the Ramanujan conjectures using the theory of modular forms	May 2013
IISER-Kolkata, India.	
When converse of Banach fixed point theorem holds	Feb 2013
IISER-Kolkata, India.	
Application of modular forms	Nov 2012
IISER-Kolkata, India.	

POSTER PRESENTATION

- *Some paramodular forms connected with elliptic curves*, AWM Workshop: Poster Presentations by Women Graduate Students, Joint Mathematics Meetings, Jan 18, 2019.

- *Paramodular Forms Coming From Elliptic Curves*, TORA X, Apr 6, 2019, *the poster received the best poster award at TORA X*.

TRAINING AND CERTIFICATION

- *The Departmental Teaching Certificate*, Department of Mathematics, University of Oklahoma, 2018

- *Teach College Mathematics*, a mandatory course for all teaching assistants in the Department of Mathematics, University of Oklahoma, 2015

- Advanced Tutor Training Programs for Business and Advanced Calculus, Department of Mathematics, University of Oklahoma, 2015

- *Professional Ethics Training course in Responsible Conduct of Research*, conducted by the National Institute of Health [NIH] and National Science Foundation [NSF], University of Oklahoma, 2015.

- *Development for International Teaching Assistants*, University of Oklahoma, 2014

SYNERGISTIC ACTIVITIES

Conference, seminar and panel co-organization

- New Developments in Number Theory Seminar, POINT, 2020-present
- Lunch discussion series: Lunch in the Time of Covid, 2020-present
- TORA IX, University of Oklahoma, 2018
- Graduate Student Seminar, University of Oklahoma, 2018
- Student Algebra Seminar, University of Oklahoma, 2017

Outreach and Mentoring

- Undergraduate Directed Reading Program, University of Oklahoma, 2016-2018
- Tutor for Undergraduate Mathematics in the Math Center, University of Oklahoma, 2014-2019
- Volunteer for Math Day, University of Oklahoma, 2014-2019
- Volunteer work and poster presentation at Prof. S. N. Bose Science Agriculture and Book Fair for the department of mathematics and statistics, IISER Kolkata, 2012

Department Service

- Teaching observation and feedback for the adjunct instructors at Fordham University, 2020
- Helped reforming the Math for Business Finite course at Fordham University, 2020

- **Reviewer** for Mathematical Reviews, August 2021-present (4 articles reviewed)

COMPUTING SKILL

Python, C, Sage, Magma, Mathematica, Latex, LMFDB

MEMBERSHIPS

- American Mathematical Society (AMS)

- Association for Women in Mathematics (AWM)

- Women in Number Theory

- People Online In Number Theory (POINT)

REFERENCES

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