

EDUCATION	<p>Emory University, Atlanta, Georgia, USA Ph.D., Department of Mathematics Advisor: Professor Suresh Venapally Co-advisor: Professor Parimala Raman Tentative thesis title: Strong u-invariant and Period-Index Bounds</p> <p>University of Hyderabad, Hyderabad, Telangana, India Integrated M.Sc. Mathematical Sciences, School of Mathematics and Statistics, September 2020 Advisor: Professor Biswajyoti Saha Thesis: On Elements of Algebraic Number Theory</p>
RESEARCH INTERESTS	<p>Quadratic forms, Local-global principles, Berkovich theory</p> <p>Galois cohomology, Linear algebraic groups, Non-Archimedean geometry</p>
PUBLICATIONS AND PREPRINTS	<p><i>Strong u-invariant and Period-Index bound for complete ultrametric fields</i>; arXiv preprint arXiv:2407.12169, 2024; (submitted)</p> <p><i>On Elements of Algebraic Number Theory</i>, Masters' Thesis</p>
ARTICLES IN PREPARATION	<p><i>Strong u-invariant and Period-Index Bounds</i>, my Ph.D. thesis (expected May 2025)</p> <p><i>Counting D_8 fields containing $\mathbb{Q}(i)$</i>, with Brandon Alberts, Helen Grundman, Alexander Slamen, and Amanda Tucker, Rethinking Number Theory project</p> <p><i>Investigating Valuations on Differential Rings using Non-Archimedean Differential Algebraic Geometry</i>, with Sreejani Chaudhury and Taylor Dupuy</p>
HONOURS AND AWARDS	<p>Women in Natural Sciences Fellow, PhD Fellowship, Emory University</p> <p>AWM Research Symposium 2025 Travel Grant recipient, AWM</p> <p>Graduate Student Travel Grants to JMM 2025 recipient, AMS</p> <p>BEGIN Bootcamp Travel Support to JMM 2025 recipient, AMS</p> <p>Dean's Teaching Fellowship (Standard) 2025-2026, Emory University</p> <p>Empowering Interdisciplinarity Graduate Workshop Fellow, Emory University, 2025</p> <p>Global Student Travel Award recipient, Emory University, Spring 2024</p> <p>Laney Graduate Student Council Travel Grant recipient, Emory University, Summer 2024, Spring 2025</p> <p>Piedmont TATTO Fellow in Sustainability, Teaching, and Curriculum, Emory University, 2023</p> <p>Innovation in Science Pursuit for Inspired Research (INSPIRE) scholar, Department of Science and Technology, Government of India</p> <p>Gold medalist of I.M.Sc Mathematical Sciences for the batch of 2020, University of Hyderabad, India</p>

RESEARCH
EXPERIENCE

Working on my PhD thesis with advisor Suresh Venapally and co-advisor Parimala Raman at Emory University to understand the behaviour of non-Archimedean valued fields under certain field invariants, their Galois cohomology groups, and quadratic forms over such fields. This involves using machinery from the Berkovich Theory of Rigid Analytic Geometry and the patching method in this set-up to arrive at a period-index bound for complete non-Archimedean valued fields. (since January 2021)

Working with Brandon Alberts, Helen Grundman, Amanda Tucker, and Alexander Slamen on a project that aims at counting number fields. Classical number-field-counting problems ask for the distributions of number fields belonging to certain families, which under the Galois correspondence is equivalent to asking for the distribution of surjective homomorphisms. A twisted version of this question has arisen as a new approach to number field counting. Let T be a group with a Galois action. The twisted question asks for the distribution of crossed homomorphisms from the absolute Galois group to T . The goal of this project is to explore the twisted question in the non-Abelian setting and to work towards understanding small non-Abelian examples. (since June 2023)

Working with Taylor Dupuy and Sreejani Chaudhury, we are exploring differential valued fields. Consider a differential ring $K\{x\} = K[x, x', x'', \dots]$, where the derivatives of x are formal, and the derivative rule is that the derivative of x is x' , etc. We are trying to understand what the geometry of this ring is, what sort of “divisor” it corresponds to, what are all the valuations, etc. (since March 2024)

Worked on my Masters’ Thesis Project in Algebraic Number Theory to understand the ongoing research in Gauss’ Class Number Problem, under the supervision of Biswajyoti Saha, at the University of Hyderabad. (July 2019 to July 2020)

TEACHING AND
MENTORING
EXPERIENCE

Emory University

Instructor of Record

Primary instructor for up to 35 students.

- MATH 112 - Calculus 2 (Spring 2025)
- MATH 112 - Calculus 2 (Fall 2024)
- MATH 112 - Calculus 2 (Spring 2024)
- MATH 112 - Calculus 2 (Spring 2023)
- MATH 111 - Calculus 1 (Fall 2022)

Graduate Teaching Assistant

Graded assignments, conducted lab sessions for up to 40 students, and held office hours.

- MATH 221 - Linear Algebra (Spring 2022)
- MATH 221 - Linear Algebra (Fall 2021)
- MATH 362 - Mathematical Statistics 2 (Spring 2021)
- MATH 362w - Probability and Statistics 2 (Spring 2021)
- MATH 361 - Mathematical Statistics 1 (Fall 2020)

Directed Reading Program Mentor

Mentored undergraduate students to learn a topic together, with guided discussions and helped prepare a final math presentation for an audience.

- Josh Kyei, *Squaring back to the 1700s*, Spelman-Morehouse DRP (Spring 2024)
- Harper Wang, *Intro to Modern Set Theory*, Emory Math DRP (Fall 2022)
- Meg Ruder, *Elementary Number Theory*, Emory Math DRP (Spring 2022)
- Sasha Ustilovsky, *Intro to Algebraic Number Theory*, Emory Math DRP (Fall 2021)

Invited Talks:

- *Strong u -invariant and Period-Index Bounds*, Algebra Seminar, Georgia Institute of Technology, March 2025
- *The Brauer Dimension of a Field*, AMS Special Session on Quaternions, JMM 2025
- *Strong u -invariant and Period-Index Bounds*, Number Theory Seminar, The Ohio State University, December 2024
- *Strong u -invariant and Period-Index Bounds*, *unQVNTS*, University of Vermont, October 2024
- *Strong u -invariant and Period-Index Bounds*, Algebra and Number Theory Seminar, Emory University, October 2024
- *Twisted Number Field Counting*, Invited Paper Session Rethinking Number Theory, MAA MathFest 2024
- *The Brauer Dimension of a Field*, Special Talk at ALGAR 2024, UAntwerp, Belgium

Contributed Talks:

- *A Twisted Variant of Malle's Conjecture*, AMS Contributed Paper Session on Number Theory and Field Theory III, JMM 2025
- *Strong u -invariant for Complete Ultrametric Fields*, AMS Contributed Papers on Topics in Algebra, JMM 2025
- (cancelled due to hurricane Helene) *Twisted Number Field Counting*, AMS Fall Southeastern Sectional Meeting, 2024
- (cancelled due to hurricane Helene) *Strong u -invariant and Period-Index bound for complete ultrametric fields*, AMS Fall Southeastern Sectional Meeting, 2024
- *A Twisted Variant of Malle's Conjecture*, Palmetto Number Theory Series (PANTS) XXXVIII, Wake Forest University, September 2024
- *Twisted Number Field Counting*, GTA: Philadelphia, Temple University, 2024
- *Local-Global Principles Over The Years*, Pre-talk at Algebra and Number Theory Seminar, Emory University, October 2023

Selected Seminar Presentations at Emory University:

- *Tidbits of Berkovich Spaces*, RANT, April 2024
- *Basic Notions of Rigid Analytic Geometry*, RANT, November 2023
- *Extensions of Dedekind Domains and Discrete Valuations*, Galois Cohomology Seminar Course, March 2023
- *Techniques from Group Cohomology-Relation to Subgroups*, Galois Cohomology Seminar Course, February 2023
- *Additive Number Theory*, Analytic Number Theory Seminar Course, May 2022
- *Free Resolutions and Syzygies*, Commutative Algebra Seminar Course, April 2022
- *What do Jabberwocky and Fava Beans have in common?*, RANT, December 2021
- *Origami Constructible Numbers*, RANT, February 2021
- *Unique Factorisation of Ideals*, Algebraic Number Theory Seminar Course, February 2021

Selected Workshop and Conference Participation:

- *AWS: Representation Theory of p -adic Groups*, University of Arizona, March 2025
- *Nilpotent Counting Problems in Arithmetic Statistics*, AIM, November 2024
- *ALGAR: Brauer groups and Galois cohomology*, UAntwerp, August 2024
- *Galois Cohomology and Massey Products*, University of Ottawa, June 2024
- *AWS: Abelian Varieties*, University of Arizona, March 2024
- *ALGAR: Local-global principles for quadratic forms*, UAntwerp, August 2023
- *Rethinking Number Theory 4* (online), June 2023

- *Arithmetic Geometry and Algebraic Groups*, University of Virginia, May 2023
- *Georgia Algebraic Geometry Symposium*, University of Georgia, April 2023
- *Meeting on Applied Algebraic Geometry*, GaTech, April 2023
- *AWS: Unlikely Intersections*, University of Arizona, March 2023
- *Birational Complexity of Algebraic Varieties*, Stony Brook, December 2022
- *Arithmetic and Topology over Global Fields*, UW-Madison, October 2022
- *ALGAR: Constructive Methods for Quadratic Form Theory* (online), UAntwerp, September 2022
- Summer reading course, *Abelian Varieties*, Emory, June-August 2022
- *Connecticut Summer School in Number Theory*, UConn, June 2022
- *AGNES*, Rutgers University, May 2022
- *Georgia Algebraic Geometry Symposium*, Emory University, April 2022
- *Young Researchers in Algebraic Number Theory* (Online), August 2021
- *AWS: Virtual School in Number Theory*, University of Arizona, January-May 2021
- *Rational Points and Galois Representations* (online workshop), May 2021
- *Mid-Atlantic Seminar on Numbers V*– MASON V(virtual), March 2021

SERVICE AND KEY ROLES

Special Session on Rethinking Number Theory, AWM Research Symposium 2025, Co-Organiser with Swati and Deewang Bhamidipati

Emory Math Directed Reading Program, Steering Committee, since January 2022

Emory Math Circle, Instructor, Emory Math outreach program, since January 2021

- Designed numerous lessons for middle and high school students around Atlanta
- Help other instructors with their lesson preparation
- Build a sense of familiarity and community among students

Association for Women in Science (AWIS) Graduate Division, Social Chair (event coordinator), Emory University, August 2023-2024

- Organise outreach and mentoring events/opportunities for women in sciences
- Bring in speakers to advocate for the women
- Conduct events including trivia night, movie night, to foster community

Spelman-Morehouse Math Directed Reading Program, Instructor, Spring 2024

- Provided a guided environment for students to explore an area of math outside of the undergraduate curriculum
- One-on-one mentorship to further students' academic growth

Undergraduate Student Poster Session, Judge at MAA MathFest 2024

Parimala Raman's 75th Anniversary Talk, Emory University, Co-Organiser with Sreejani Chaudhury, 2023

MAA Graduate Student Blog: Learning Through the Ranks, Staff writer

AWM Emory Chapter, Vice President/Secretary, March 2022 to present.

Julia Robinson Math Festival at Emory University, Volunteer, August 2022.

MEMBERSHIPS

American Mathematical Society (AMS), Mathematical Association of America (MAA), Association for Women in Mathematics (AWM), Association for Women in STEM (AWIS)

SKILLS

Language: English, Hindi (native speaker), Bengali (native speaker)
Computer: \LaTeX , Microsoft Office, HTML