

Yukta Lodha

Ph.D. Candidate in Mathematics
University of Connecticut, Storrs, Connecticut
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Education

Ph.D. in Mathematics University of Connecticut, Storrs, Connecticut Advisor: Guozhen Lu Co-Advisors: Ambar N. Sengupta and Nguyen Lam	2023–Present
M.S. in Mathematics University of Connecticut, Storrs, Connecticut	2025
M.S. in Mathematics Sikkim Manipal Institute of Technology, India Advisor: Biswajit Deb Master's Thesis: <i>Isomorphic Classes of Alternating Sign Matrices</i> [Thesis]	2020–2022

Research Interests

Functional inequalities, partial differential equations, harmonic analysis, and geometric analysis, with particular emphasis on sharp constants, extremizers, stability, and spectral methods. Current research includes the Heisenberg uncertainty principle, Caffarelli–Kohn–Nirenberg inequalities, weighted Poincaré inequalities, and related problems on domains with boundary.

Publications

- Nguyen Lam, **Yukta Lodha**, Guozhen Lu, and Ambar N. Sengupta. *Heisenberg Uncertainty Principle on Half Spaces and Orthants: Best Constants, Optimizers and Stability. Advanced Nonlinear Studies*, 2026. [arXiv]

Work in Progress

- *Caffarelli–Kohn–Nirenberg Inequalities and Weighted Poincaré Inequalities on Orthants and Their Stability*. Manuscript in preparation.

Research Presentations & Conferences

- **Participant**, PDE Workshop, Rutgers University, 2026.
Satellite conference of the International Congress of Mathematicians.
- **Poster Presentation**, Workshop on Nonlinear PDEs and Stochastic Methods, University of Jyväskylä, Finland, 2026.
Sharp Functional Inequalities on Half-Spaces and Orthants: Heisenberg Uncertainty Principle and Its Stability
- **Research Presentation**, Graduate Research Forum, University of Connecticut, 2026.
- **Contributed Talk**, FADE Conference, Fairfield University, 2026.
- **Contributed Talk**, AMS Eastern Sectional Meeting, Boston College, 2026.
Heisenberg Uncertainty Principle on Half Spaces and Orthants: Best Constants, Optimizers and Stability
- **Invited Talk**, Department of Mathematics, Sikkim Manipal Institute of Technology, 2026.
Functional Inequalities on L^p Spaces

Teaching & Mentoring Experience

Department of Mathematics, University of Connecticut • Instructor, Calculus for Business and Economics	2023–Present
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- Prepared and delivered lectures, developed course materials, and guided students through applications of calculus in business and economics
- Assessed student progress through assignments, quizzes, examinations, and grading
- **Teaching Assistant, Calculus I, Calculus II, and Multivariable Calculus**
 - Led review sessions and provided focused explanations of important concepts before quizzes and examinations
 - Solved representative problems and responded to student questions to strengthen conceptual understanding and problem-solving skills
 - Assisted with course preparation, grading, assessment, and communication with students
 - Supported students during office hours and provided individualized guidance on course material
- **Directed Reading Program Mentor**
University of Connecticut
 - Mentored an undergraduate student through guided mathematical reading and weekly one-on-one meetings
 - Encouraged independent problem solving, mathematical communication, and confidence in approaching advanced material

Service & Outreach

Organizer, Mathematics Continued Conference

University of Connecticut

- Helped organize a conference for undergraduate students, including first-generation students
- Coordinated scheduling, logistics, communication, talks, panel discussions, and research presentations

Honors & Achievements

- NSF Travel Support, Workshop on Nonlinear PDEs and Stochastic Methods, University of Jyväskylä, Finland, 2026
- Conference Participation Award, The Graduate School, University of Connecticut
- Ranked in the top 4.6% nationally among 13,518 candidates in GATE Mathematics, 2022
- Qualified IIT JAM Mathematics, a national-level competitive examination in India

Technical Skills

- **Academic Tools:** LaTeX, Gradescope
- **Programming:** Java, C, C++