

CURRICULUM VITAE

Prerona Dutta

Department of Mathematics, Xavier University of Louisiana
1 Drexel Drive, Box 113, New Orleans, LA 70125, USA
Webpage: <https://preronadutta.com/>
Email: pdutta@xula.edu
ORCID: <https://orcid.org/0000-0002-9424-0173>

Employment

- August 14, 2024 onwards **Assistant Professor (tenure-track)**
Department of Mathematics,
Xavier University of Louisiana, New Orleans LA, USA
- August 15, 2021 - August 13, 2024 **Arnold Ross Assistant Professor**
Department of Mathematics,
The Ohio State University, Columbus OH, USA
Postdoctoral mentor: Prof. Barbara Lee Keyfitz
- August 21, 2017 - May 15, 2021 **Graduate Teaching Assistant**
Department of Mathematics,
North Carolina State University, Raleigh NC, USA

Education

- May 15, 2021 **Doctor of Philosophy (Ph.D.) in Mathematics**
North Carolina State University, Raleigh NC, USA
Advisor: Prof. Khai T. Nguyen
Thesis: Metric entropy and nonlinear partial differential equations
- June 30, 2016 **Master of Science (M.Sc.) in Mathematics**
Pondicherry University, Puducherry PY, India
- May 31, 2014 **Bachelor of Science (B.Sc.) Honors in Mathematics**
St. Xavier's College (Autonomous), Kolkata WB, India

Honors and Awards

- January 2026 - December 2027 **NSF LEAPS-MPS grant no. DMS 2532664**
Award amount: \$ 245,851 (Sole Principal Investigator)
Launching Early-Career Academic Pathways in the
Mathematical and Physical Sciences,
National Science Foundation, USA
- April 2026 - June 2027 **MAA Tensor Outreach grant**
Award amount: \$ 8,000 (Co-Director)
Mathematical Association of America, USA

- April 2021 **Franke-Norris-Griggs Award for Research**
Department of Mathematics,
North Carolina State University, Raleigh NC, USA

- April 2021 **Maltbie Award for Teaching**
Department of Mathematics,
North Carolina State University, Raleigh NC, USA

- April 2021 **Outstanding Teaching Assistant Award**
Graduate Student Association - Teaching Effectiveness Committee,
North Carolina State University, Raleigh NC, USA

- November 2017 **Eligibility for Assistant Professorship (CSIR-UGC NET qualified)**
onwards Council of Scientific and Industrial Research,
Ministry of Human Resource Development, Government of India

- 2011 – 2016 **DST-INSPIRE Scholarship for Higher Education**
Department of Science and Technology, Government of India

Research Interests

- Nonlinear analysis
- Partial differential equations
- Geometric measure theory
- Optimal control

Scientific Publications

1. P. Dutta and B.L. Keyfitz, Weak diffeomorphisms and extremals for scalar conservation laws, *submitted*, 2026.
2. P. Dutta, K.T. Nguyen and S.N.T. Tu, On the rate of convergence in superquadratic Hamilton-Jacobi equations with state constraints, *Nonlinear Differential Equations and Applications*, **33** (63), 1–31, 2026.
3. P. Dutta and B.L. Keyfitz, Non-uniform dependence on periodic initial data for the two-component Fornberg-Whitham system in Besov spaces, *AIMS Mathematics - Special Issue on Real-Variable Theory of Function Spaces and its Applications*, **9** (9), 25284–25296, 2024.
4. P. Dutta, Well-posedness of the two-component Fornberg-Whitham system in Besov spaces, *La Matematica - Official Journal of the Association for Women in Mathematics*, **3** (2), 704–720, 2024
5. P. Dutta, Extending Lagrangian transformations to nonconvex scalar conservation laws, *Electronic Journal of Differential Equations*, **2022** (78), 1–12, 2022
6. S. Bianchini, P. Dutta and K. T. Nguyen, Metric entropy for Hamilton-Jacobi equation with uniformly directionally convex Hamiltonian, *SIAM Journal on Mathematical Analysis*, **54** (5), 5551–5575, 2022
7. R. Capuani, P. Dutta and K. T. Nguyen, Metric entropy for functions of bounded total generalized variation, *SIAM Journal on Mathematical Analysis*, **53** (1), 1168–1190, 2021
8. P. Dutta and K. T. Nguyen, Covering numbers for bounded variation functions, *Journal of Mathematical Analysis and Applications* **468** (2), 1131–1143, 2018

Teaching Experience

• Teaching at XULA

▪ Independent Instructor

- MATH 2030: Elementary Linear Algebra - Fall 2026
- MATH 4060: Real Analysis II - Spring 2026
- MATH 4050: Real Analysis I - Fall 2025
- MATH 1070: Introductory Calculus (2 sections) - Spring 2025

▪ Coordinated Instructor

- MATH 0990 D: Preparation for College Mathematics (2 sections) - Fall 2026
- MATH 1030 I: Intensive Precalculus - Spring 2026
- MATH 0990 L: Preparation for College Mathematics Drill - Spring 2026
- MATH 1030: Precalculus - Fall 2025
- MATH 1030 I: Intensive Precalculus - Fall 2025
- MATH 1030 I: Intensive Precalculus (2 sections) - Fall 2024

• Teaching at OSU

▪ Independent Instructor

- MATH 2415: Ordinary and Partial Differential Equations - Spring 2024
- MATH 2255: Differential Equations and their Applications - Spring 2024
- MATH 4556: Dynamical Systems (2 sections) - Autumn 2023

▪ Coordinated Instructor

- MATH 1152: Calculus II - Spring 2023
- MATH 1151: Calculus I (2 sections) - Autumn 2022

▪ Recitation Instructor

- MATH 1152: Calculus II (2 sections) - Spring 2023
- MATH 1151: Calculus I - Autumn 2021, Spring 2022
- MATH 6212: Real Analysis II (Graduate course) - Spring 2022
- MATH 6211: Real Analysis I (Graduate course) - Autumn 2021

• Teaching at NCSU

▪ Independent Instructor

- MA 121: Elements of Calculus - Summer (Session II) 2020
- MA 108: Precalculus II - Spring 2020

▪ Coordinated Instructor

- MA 241: Calculus II - Spring 2021

- MA 141: Calculus I - Fall 2020
- **Recitation Instructor**
- MA 141: Calculus I - Fall 2018, Fall 2019
 - MA 242: Calculus III - Summer (Session I) 2019
- **Lecture Assistant**
- MA 231: Calculus for Life and Management Sciences B - Spring 2019
 - MA 341: Applied Differential Equations I - Spring 2018
 - MA 107: Precalculus I - Fall 2017

Mentoring Experience

- September 2026 onwards
Undergraduate research
 - *Mentee: Gabriela Journée,
Xavier University of Louisiana (undergraduate), USA*

- May 2026
- June 2026
Summer Program on Analysis and Measure (SPAM) 2026
Topic - Conservation law models for traffic flow
 - *Mentee 1: Indyanna Cramer,
Xavier University of Louisiana (undergraduate), USA*
 - *Mentee 2: Jeremiah Tunis,
University of New Orleans (graduate), USA*
 - *Mentee 3: Samantha Moloughney,
Loyola University New Orleans (undergraduate), USA*
 - *Mentee 4: Jackson Scrimshire,
Tulane University (undergraduate), USA*
 - *Mentee 5: Jace Luckoski
Loyola University New Orleans (undergraduate), USA*

- January 2026
- May 2026
Undergraduate research
 - *Mentee: Modesola Giwa,
Xavier University of Louisiana (undergraduate), USA
Topic of directed reading - Average smoothness analysis of functions*

- August 2023
- May 2026
- AWM Mentor Network
- *Mentee 1: Jayme Reed,
Millikin University (undergraduate), USA
Topic of directed reading - Dynamical Systems*
 - *Mentee 2: Bipasha Chakraborty,
Jadavpur University (graduate), India
Topic of directed reading - Measure Theory*
 - *Mentee 3: Kimaria Miller,
Savannah State University (undergraduate), USA*
 - *Mentee 4: Cristal Harris,
University of Michigan-Dearborn (undergraduate), USA*

Conferences, Seminars and Workshops

• Organization

- July 2026
- Co-organizer
Minisymposium - “Recent Trends in Nonlinear Partial Differential Equations: Theory, Computation, Applications”,
SIAM Annual Meeting 2026,
Cleveland OH, USA
- May 2026
- Organizer
Summer Program on Analysis and Measure (SPAM) 2026,
(Funded by NSF LEAPS-MPS grant no. DMS 2532664)
Xavier University of Louisiana, New Orleans LA, USA
- October 2025
- Organizer
Special session - “Advances and Challenges in Hyperbolic Conservation Laws”,
AMS Fall Eastern Virtual Sectional Meeting
- October 2025
- Co-organizer
Special session - “Advances and Challenges in the Study of Nonlinear PDEs”,
AMS Fall Southeastern Sectional Meeting,
Tulane University, New Orleans LA, USA
- August 2024
onwards
- Co-organizer
Math at Xavier (M@X) Seminar,
Xavier University of Louisiana, New Orleans LA, USA
- October 2023
- Organizer
Mini-symposium - “Recent Advances in the Analysis of PDEs”,
SIAM Great Lakes Meeting,
Michigan State University, East Lansing MI, USA
- January - May
2022
- Co-organizer
Partial Differential Equations Seminar,
The Ohio State University, Columbus OH, USA

- August - December 2019 Co-organizer
Nonlinear Analysis Students' Seminar,
North Carolina State University, Raleigh NC, USA

• Invited talks

- October 2026 Special session - "Advances in Convex Analysis and Optimal Control",
AMS Fall Southeastern Sectional Meeting,
Kennesaw State University, Kennesaw GA, USA
- January 2026 AMS Special session - "Analysis and Differential Equations
at Undergraduate Institutions",
Joint Mathematics Meeting,
Washington D.C., USA
- November 2025 Applied and Computational Mathematics Seminar,
Tulane University, New Orleans LA, USA
- October 2025 Special session - "Recent Advances in Numerical Methods for
Ordinary/Partial Differential Equations and Their Applications",
AMS Fall Southeastern Sectional Meeting,
Tulane University, New Orleans LA, USA
- July 2025 Special session - "Conservation Laws: Mathematical and
Numerical Analysis with Applications",
Mathematical Congress of the Americas 2025,
Miami FL, USA
- April 2025 Partial Differential Equations Seminar,
The Ohio State University, Columbus OH, USA
- March 2025 Special session - "Frontiers in Nonlinear PDE and
Applied Mathematical Challenges",
AMS Spring Central Sectional Meeting,
University of Kansas, Lawrence KS, USA
- November 2024 42nd Southeastern-Atlantic Regional Conference on Differential Equations,
West Virginia University, Morgantown WV, USA
- April 2024 Mathematics Colloquium,
North Dakota State University, Fargo ND, USA
- February 2024 Research Talk,
Marshall University, Huntington WV, USA
- January 2024 Mathematics Departmental Seminar,
Murray State University, Murray KY, USA
- June 2023 International Conference on Differential Equations and Control Problems,
Indian Institute of Technology (IIT), Mandi HP, India
- May 2023 42nd Siksha 'O' Anusandhan Weekly Academic Lecture,
Siksha 'O' Anusandhan (Deemed to be University) - Centre for Data Science, India

- March 2023 Mini-symposium - “Recent Advances in Differential Equations and Applications”,
SIAM Southeastern Atlantic Section Annual Meeting,
Virginia Tech, Blacksburg VA, USA
- March 2022 Special session - “Analysis of Nonlinear Evolution Equations”,
AMS Spring Central Sectional Meeting (virtual),
American Mathematical Society, USA
- April 2021 Partial Differential Equations Seminar,
The Ohio State University, Columbus OH, USA

• Contributed talks

- July 2026 Minisymposium on “Recent Trends in Nonlinear Partial Differential Equations:
Theory, Computation, Applications”,
SIAM Annual Meeting 2026,
Cleveland OH, USA
- January 2026 AMS Contributed Paper Session on Partial Differential Equations,
Joint Mathematics Meeting,
Washington D.C., USA
- October 2025 3rd UNC Greensboro Virtual PDE Conference
UNC Greensboro, Greensboro NC, USA
- July 2025 Indian Women and Mathematics (IWM) Annual Conference,
Indian Institute of Technology (IIT) Patna, Patna BR, India
- February 2025 Math at Xavier (M@X) Seminar,
Xavier University of Louisiana, New Orleans LA, USA
- April 2024 88th Midwest PDE Seminar,
The Ohio State University, Columbus OH, USA
- November 2023 Association for Women in Mathematics (AWM) Symposium,
University of Manitoba, Canada
- November 2023 41st Southeastern-Atlantic Regional Conference on Differential Equations,
Florida A&M University, Tallahassee FL, USA
- October 2023 SIAM Great Lakes Meeting,
Michigan State University, East Lansing MI, USA
- November 2022 40th Southeastern-Atlantic Regional Conference on Differential Equations,
North Carolina State University, Raleigh NC, USA
- November 2021 Analysis and PDE Joint Seminar,
The Ohio State University, Columbus OH, USA
- February 2021 Graduate Recruitment Weekend - Research Presentations,
North Carolina State University, Raleigh NC, USA
- December 2020 Triangle Area Graduate Mathematics Conference,
UNC Chapel Hill, North Carolina State University and Duke University, USA
- February 2020 Nonlinear Analysis Students’ Seminar,
North Carolina State University, Raleigh NC, USA

- November 2019 Nonlinear Analysis Students' Seminar,
North Carolina State University, Raleigh NC, USA
- April 2019 Nonlinear Analysis Students' Seminar,
North Carolina State University, Raleigh NC, USA
- February 2018 Nonlinear Analysis Students' Seminar,
North Carolina State University, Raleigh NC, USA
- February 2018 Differential Equations/Nonlinear Analysis Seminar,
North Carolina State University, Raleigh NC, USA

• Short Talks and Poster Presentation

- July 2026 Short Communications,
International Congress of Mathematicians (ICM), USA
- September 2021 “We Speak” speaker series: Inspiring Women in Math,
AWM 50th Anniversary - Early-Career Mathematicians Lightning Talks, USA
- July 2021 AWM Workshop: Poster Session (MP2),
SIAM Annual Meeting (AN21), USA

• Conferences attended

- May 2021 Advances and Challenges in Hyperbolic Conservation Laws,
ICERM Summer Workshop - Virtual Only
- October 2019 39th Southeastern-Atlantic Regional Conference on Differential Equations,
Embry-Riddle Aeronautical University, Daytona Beach FL, USA
- February 2016 National Conference on Recent Developments in Mathematical Analysis
and its Applications,
Pondicherry University, Puducherry, India
- January 2016 National Conference on Algebra and its Applications,
Pondicherry University, Puducherry, India
- July 2015 International Conference on Graph Theory and its Applications,
Pondicherry University, Puducherry, India

Enrichment Opportunities

- August 2025 Faculty Portfolio Writing Group
- May 2026 Xavier University of Louisiana, New Orleans LA, USA
- June-July 2016 Annual Foundation School (AFS) II organized by National Centre for Mathematics,
Kerala School of Mathematics, Kozhikode KL, India
- May-June 2015 Mathematics Training and Talent Search (MTTS) Programme
(Level 2, Main Camp) organized by MTTS Trust,
SSN College of Engineering, Chennai TN, India
- May-July 2014 Summer Research Fellowship Programme organized by Indian Academy of Sciences,
Indian Institute of Science Education and Research (IISER), Mohali, India
- *Advisor: Dr. Lingaraj Sahu*
- *Project title: A study of linear operators on finite-dimensional vector spaces*

Professional Service

- August 2025
- May 2027 Member of Faculty Load Advisory Committee
University Standing Committee
Xavier University of Louisiana
- August 2025
- May 2027 Member of Faculty/Staff Fringe Benefits Committee
University Standing Committee
Xavier University of Louisiana
- January 2026
- May 2026 Member of Search Committee (NTT position)
Department of Mathematics
Xavier University of Louisiana
- September 2026 Reviewer for Journal of Nonlinear Mathematical Physics
Springer Nature
- October 2025 Session Chair for Parallel Session G3
3rd UNC Greensboro Virtual PDE Conference
UNC Greensboro, Greensboro NC, USA
- July 2025 Session Chair for “Early-stage Talk 2”
Indian Women and Mathematics (IWM) Annual Conference 2025
Indian Institute of Technology (IIT) Patna, Patna BR, India
- February 2025 Panelist for discussion on “Math Careers”
Gulf States Math Alliance Meeting 2025
Southern University of New Orleans, New Orleans LA, USA
- January 2025
onwards Member of Curriculum Committee
Department of Mathematics
Xavier University of Louisiana
- August 2024
onwards Member of Recruitment & Retention Committee
Department of Mathematics
Xavier University of Louisiana
- February 2024
- February 2027 Member of AWM Mentor Network Committee
Association of Women in Mathematics
- February 2024,
2025 and 2026 Judge for AWM Essay Contest
Association for Women in Mathematics
- June 2024
- July 2026 Reviewer for zbMATH Open
FIZ Karlsruhe - Leibniz Institute for Information Infrastructure GmbH
- 2023 onwards Mentor with Math Alliance
Purdue University
- 2023 onwards Mentor with AWM Mentor Network
Association for Women in Mathematics
- 2023 onwards Reviewer for Mathematical Reviews (MathSciNet)
American Mathematical Society
- August 2023 Panelist for discussion on “Teaching in upper-, transition-, lower-division courses”
New Math Faculty Orientation
The Ohio State University, Columbus OH, USA
- Spring 2022 Webmaster for Partial differential equations Seminar
The Ohio State University, Columbus OH, USA

- Spring 2018 and 2019 Tutor at Mathematics Multimedia Center, North Carolina State University, Raleigh NC, USA
- Fall 2018 - 2019 Webmaster for Nonlinear Analysis Thematic Group, North Carolina State University, Raleigh NC, USA
- 2013 - 2014 Editor-in-Chief of “Beacon” - Math Department annual magazine, St. Xavier’s College (Autonomous), Kolkata WB, India
- 2012 - 2013 Member of the editorial board of “Beacon” - Math Department annual magazine, St. Xavier’s College (Autonomous), Kolkata WB, India
- October 2013 Organizing committee member of “Analytica” - Math Department annual seminar, St. Xavier’s College (Autonomous), Kolkata WB, India

Outreach Activities

- February-April 2026 Co-organizer
“XULA Math Circle”: Semester-long mathematical outreach program for local school students of grades 6-12, Department of Mathematics, Xavier University of Louisiana, New Orleans, LA, USA
- April 2025 and 2026 Co-organizer
“Math Fair”: Annual outreach event for local school students of grades 9-12, Department of Mathematics, Xavier University of Louisiana, New Orleans, LA, USA
- June 2023 Public lecture for undergraduate students
Topic - A bird’s eye view of Mathematical Analysis, Muralidhar Girls’ College, Kolkata WB, India
- June 2023 Math excellence workshops for school students (Class IX-X)
Topics - Number System and Trigonometry, The Future Foundation School, Kolkata WB, India
- September 2021 Virtual lecture for high school students (Class XI-XII)
Topic - Applications of Derivatives, Modern High School for Girls, Kolkata WB, India
- July 2020 Virtual interactive session with school students (Class X)
Topic - Career Prospects of Higher Studies in Mathematics, The Future Foundation School, Kolkata WB, India
- October 2019 Co-organizer of “Problem Solving Session for Putnam”
130th Anniversary Celebration of the Mathematics Department
North Carolina State University, Raleigh NC, USA
- October 2018 and 2019 Volunteer
“Math Doesn’t Bug Me” annual event at BugFest, Museum of Natural Sciences, Raleigh NC, USA
- Spring and Summer 2012 Volunteer
Teaching underprivileged children as part of the National Service Scheme (NSS), St. Xavier’s College (Autonomous), Kolkata WB, India

Professional Memberships

- American Mathematical Society (AMS)
- Society for Industrial and Applied Mathematics (SIAM)
- Association for Women in Mathematics (AWM)
- American Association for the Advancement of Science (AAAS)