

Manaswinee Bezbaruah

Curriculum Vitae

Massy, Île-de-France, FR
✉ manaswinee.b@gmail.com

EXPERIENCE

- Postdoctoral Researcher** 2025 - Present
POEMS, Unité de Mathématiques Appliquées (UMA)
ENSTA Paris, Palaiseau, France
- Graduate Teaching/Research Assistant** 2019 - 2025
Department of Mathematics,
Texas A&M University, College Station, TX, USA
- Computing Scholar** Summer 2024
MFEM - Finite Element Discretization Library,
Lawrence Livermore National Laboratory, Livermore, CA, USA
- Graduate Research Assistant** Summer 2023
T-5 Division (X-Ray and CT),
Los Alamos National Laboratory, Los Alamos, NM, USA

EDUCATION

- Doctor of Philosophy, Mathematics** Spring 2025
College of Science and Engineering, **Texas A&M University, College Station**
Chair: Dr. Matthias Maier, Co-Chair: Dr. Timothy Davis
- Bachelor of Science (Honors), Mathematics** Spring 2019
College of Science and Engineering, **University of Minnesota, Twin Cities**
Minor: Computer Science

RESEARCH INTERESTS

Numerical methods for PDEs, finite element methods, finite element software, parallel and distributed computing, PDE-constrained optimization, sign-changing PDEs, shape optimization, time-harmonic Maxwell's equations.

PUBLICATIONS AND PRE-PRINTS

- M. Bezbaruah, M. Maier, W. Wollner (2024)
Shape optimization of optical microscale inclusions.
SIAM Journal on Scientific Computing, 46(4), B377–B402,
Available at: <https://doi.org/10.1137/23m158262x>
- T. Mattson, M. Bezbaruah, M. Maier, S. McMillan, M. Pelletier, E. Welch, T. Davis (2024)
Indexed Binary Operations in the GraphBLAS.
IEEE HPEC 2024 [Conference Proceeding],
Available at: <https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=10938456&tag=1>

SOFTWARE DEVELOPMENT

Time-harmonic Maxwell's Equations Solver, deal.ii step-81
Texas A&M University, College Station, TX, USA

Shape Optimization of Microscale Inclusions, <https://zenodo.org/records/10459309>
Texas A&M University, College Station, TX, USA

RESEARCH PROJECTS

Numerical Analysis of Maxwell's Equations in Cold Plasma 2025 - Present
Mentors: Dr. Patrick Ciarlet and Dr. Maryna Kachanovska
ENSTA Paris, Palaiseau, Île-de-France, France

Parallel Implementation of Finite Element Assembly 2024 - 2025
Mentors: Dr. Matthias Maier and Dr. Timothy A Davis
Texas A&M University, College Station, TX, USA

GPU Implementation of Target-Matrix Optimization Paradigm Algorithms Summer 2024
Mentor: Dr. Ketan Mittal
Lawrence Livermore National Laboratory, Livermore, CA, USA

Eigenvalue Optimization of Microstructures 2023 - 2025
Mentor: Dr. Matthias Maier
Texas A&M University, College Station, TX, USA

Sparse View Tomography: Shape Optimization Summer 2023
Mentors: Dr. Michael McCann and Dr. Marc Klasky
Los Alamos National Laboratory, Los Alamos, NM, USA

Shape Optimization of Microstructures 2022 - 2023
Mentors: Dr. Matthias Maier and Dr. Winnifred Wollner
Texas A&M University, College Station, TX, USA

SELECTED TALKS

DGA Meeting ENSTA, Paris Feb 2026
Analysis and Simulation of 2D Maxwell's equations in Cold Plasma

MetaMAT Weekly Seminars Imperial College London (Online) Jan 2026
Shape and Eigenvalue Optimization of Microstructures Governed by Maxwell's Equations

7th Annual SIAM TX-LA Meeting Baylor University, Waco, TX Nov 2024
Shape and Eigenvalue Optimization of Microstructures Governed by Maxwell's Equations

Finite Element Rodeo 2024, Rice University, Houston, TX Mar 2024
Shape Optimization of Microstructures Governed by Maxwell's Equations

LANL T-Division Lightning Talks Los Alamos National Laboratory, Los Alamos, NM Jul 2023
What's in The Box?: A Spline Interpolation Approach

Texas Women in Math Symposium University of Texas, Austin, TX <i>Shape Optimization of Microstructures Governed by Maxwell's Equations</i>	Mar 2023
Idaho Conference of Undergraduate Research Boise State University, Boise, ID <i>Context Directed Sorting: Robustness and Complexity</i>	Jul 2018
Central States Math Undergrad Conference University of Nebraska, Lincoln, NE <i>The Poisson Process and Phylogenetic Trees</i>	Apr 2018

———— SERVICE AND TEACHING

Conferences, Summer Schools, Workshops

<i>SIAM TX-LA Section Meeting Mini-symposiums</i> Co-organizer (with J.Hoffart) “Advances in numerical methods for electromagnetism”	Oct 2024
Co-organizer (with J.Hoffart) “Recent developments in electromagnetics and related eigenvalue problems”	Nov 2023
<i>SIAM TX-LA Section Meeting Career Panel</i> Co-organizer (with K. Eifler and F. Sottile)	Oct 2020
<i>Undergraduate Summer School on Modeling and Simulation with PDEs</i> <i>Texas A&M University</i> Co-organizer and facilitator	June 2025
Co-founder and co-organizer	June 2024

Teaching and Mentorship

<i>Graduate Teaching Duties Texas A&M University</i> Teaching Assistant: Engineering Mathematics 1 (MATH 151)	Fall 2024
Grader: Advanced Engineering Mathematics (MATH 401)	Spring 2024
Teaching Assistant: Functions, Trigonometry, and Linear Systems (MATH 150)	Fall 2022
Teaching Assistant: Principles of Numerical Analysis (MATH 437)	Fall 2021
Help Session Tutor: Advanced Calculus (MATH 409) and Linear Algebra (MATH 323)	Fall 2021
Grader: Advanced Engineering Mathematics (MATH 401)	Spring 2020
Grader: Modern Algebra I (MATH 415)	Fall 2019
Help Session Tutor: Various Undergraduate Linear Algebra Courses	Fall 2019
<i>Texas A&M Directed Reading Program</i> Introduction to Virus Dynamics and Immunity (Mentees: D. Duong and J. Rodriguez)	Fall 2022
An Introduction to Potential Flow (Mentee: D. Maywald)	Spring 2022
(Fall 2020): Cryptography with Elliptic Curves (Mentee: R. Todora)	Fall 2020
Solvability and Algorithms (Mentee: S. Pineda)	Spring 2020

Student Organizations

<i>American Women in Mathematics, TAMU Student Chapter</i> President	2023-2024
<i>American Mathematical Society, TAMU Student Chapter</i> President	2021-2022
Social Coordinator	2020-2021

Diversity Committee Department of Mathematics Graduate Students, TAMU

President

2024-2025

Co-founder Communications Coordinator

2020-2022

Society of Industrial & Applied Math TAMU Student Chapter

Secretary

2020-2021