Kamrun Nahar Keya

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EDUCATION

Doctor of Philosophy, Applied Mathematics — **Expected August 2027**
Arizona State University — **Tempe, AZ, USA**

Master of Arts, Applied Mathematics — **August 2024**
Arizona State University — **Tempe, AZ, USA**

Master of Science, Mathematics — **March 2019**
University of Dhaka — **Dhaka, Bangladesh**

Bachelor of Science, Mathematics — **August 2017**
University of Dhaka — **Dhaka, Bangladesh**

RESEARCH PROJECTS

- **Fast Updating of Low-Rank Matrix Factorization:** Developing efficient algorithms for rapid parameter updates in large-scale matrix factorization problems.
- **Low-Rank Online Matrix Factorization:** Designing online optimization techniques for dynamic and streaming data environments.
- **Randomized Tensor Canonical Polyadic Decomposition (CPD):** Investigating randomized approaches for scalable tensor decomposition and multi-dimensional data analysis.
- **Data-induced discrete two-population model for flour beetle:** Analyzed and investigated the dynamics of Tribolium confusum and found a model that aligns with experimental data.

WORK EXPERIENCE

Graduate Teaching Associate — **August 2022 - Present**
Arizona State University — **Tempe, AZ, USA**

- Teach Calculus for Engineers I (MAT 265) to a class of 40 undergraduate students, incorporating real-world engineering applications to enhance conceptual understanding.
- Conducted a recitation class on pre-calculus (MAT 171), administering quizzes, and demonstrating the application of calculus.
- Graded and tutored Linear Algebra (MAT 342) and MATLAB (MAT 275).
- Served as a Teaching Assistant for graduate-level courses: Partial Differential Equations (APM 502) and Applied Analysis (APM 503).

Lecturer — **September 2019 - July 2021**
Military Institute of Science and Technology — **Dhaka, Bangladesh**

- Taught concepts of differential and integral Calculus to a class of 90 students and elaborated on applications of calculus in engineering; Prepared exam materials and proctored all students during exams.
- Taught concepts of Probability and Statistics to a class of 50 students, Laplace Transformation to a class of 27 students, Numerical Analysis to a class of 27 students, and Complex Variables to a class of 60 students.
- Served on syllabus review committee and revised syllabus for 2 courses by adding concepts of calculus and Laplace Transformation application, broadly deployed in engineering.

SKILLS

Programming Languages	**:**	MATLAB | Python | Julia | FORTRAN | Mathematica | Machine learning.
Technical Skills	**:**	Microsoft Office suite (Word, PowerPoint, and Excel), Latex.
Professional Skills	**:**	Optimization, Numerical Simulation, Parameter estimation, Data-driven decision-making, Data visualization, Quantitative analysis, Leadership, Management, Organization, Communication, Teamwork, Handling Confidential Information.

PUBLICATIONS

- Brozak, S. J., **Keya, K. N.**, Kuang, Y., *et al.* (2025). Global dynamics of a discrete two-population model for flour beetle growth. *Mathematical Biosciences and Engineering*, 22(8), 1980–1998. https://doi.org/10.3934/mbe.2025072
- Kamrujjaman, M., Akter, S., **Keya, K. N.**, *et al.* (2025). Mathematical analysis of a resource-based dispersal model with Gompertz growth and optimal harvesting. *International Journal of Differential Equations*, https://doi.org/10.1155/ijde/5543474
- Kamrujjaman, M., **Keya, K. N.**, *et al.* (2023). Spatio-temporal solutions of a diffusive directed dynamics model with harvesting. *Journal of Applied Mathematics and Computing*, Springer. https://doi.org/10.1007/s12190-022-01742-x
- Kamrujjaman, M., Zahan, I., **Keya, K. N.**, Hassan, M. N. (2022). Interplay of resource mappings and evolutionary diffusion: Competitive exclusion and coexistence analysis. *Partial Differential Equations in Applied Mathematics*, 5, 100398. https://doi.org/10.1016/j.padiff.2022.100398
- **Keya, K. N.**, Kamrujjaman, M., Islam, M. S. (2021). The influence of density in population dynamics with strong and weak Allee effect. *Journal of the Egyptian Mathematical Society*, 29(4). https://doi.org/10.1186/s42787-021-00114-x
- Kamrujjaman, M., **Keya, K. N.** (2018). Global analysis of a directed dynamics competition model. *Journal of Advances in Mathematics and Computer Science*, 27(2), 1–14. https://doi.org/10.9734/JAMCS/2018/41247

LEADERSHIP EXPERIENCE

President **April 2024 – April 2026**
Association for Women in Mathematics, Student chapter. **Tempe, AZ, USA**

- Leading the AWM student Chapter and managing its activities in accordance with the policies and procedures of AWM.
- Organize events, manage budget, and guide other officers to have a successful academic year.

Treasurer **August 2025 - Present**
SIAM Student chapter. **Tempe, AZ, USA**

- Keep accurate and adequate records of assets and transactions; Prepared the Chapter's Annual Financial Report.
- Secure sponsorships and funds from the School of Mathematical and Statistical Sciences, SIAM, GSG, and ASU to support the financial aspects of the SIAM chapter meetings.

Travel Grant Reviewer **January 2023 – December 2024**
Graduate Student Government. **Tempe, AZ, USA**

- Reviewed travel grant proposals for ASU graduate students, ensuring their travel purpose fit into the ASU charter.

Treasurer **August 2023 - April 2024**
Association of Women in Mathematics, Student chapter. **Tempe, AZ, USA**

- Kept accurate and adequate records of assets and transactions using Excel; Prepared the Chapter's Annual Financial Report using Excel; Secured sponsorships and funding from the School of Mathematical and Statistical Sciences and GSG, ASU to support financial aspects of the AWM chapter meetings.

REU Mentor **July 2023 - August 2023**
Arizona State University **Tempe, AZ, USA**

- Provided research guidance and MATLAB support to a diverse group of 4 undergraduate research students; Enhanced leadership and communication skills by mentoring a diverse group of students; Facilitated group meetings to address academic, personal, and career-related concerns

PROFESSIONAL & CAMPUS INVOLVEMENT

- Volunteered at the ASU Open Door in 2023 and 2025 at the Tempe campus to assist non-major students interested in mathematics, showcasing star individuals from mathematics.
- Volunteered at the ASU homecoming block party in 2023, 2024, and 2025 at the Tempe Campus by showcasing the mathematics department and its involvement.
- Volunteered in the 2023, 2024, and 2025 Graduate recruitment events by navigating new students about campus life and student life and presenting club information.

AWARDS & HONORS

- 2025 Distinguished Student Leader Award.
- 2024 Distinguished Student Leader Award.
- 2023 Distinguished Student Leader Award.
- 2022 Block grant fellowship from Arizona State University
- 2021 Bangladesh-Sweden Trust Fund (Travel fund for higher education).
- 2021 Research Excellence Award from the Military Institute of Science and Technology, Bangladesh.

CONFERENCES, WORKSHOPS, AND SEMINARS

Professional Development

2025 Research Collaboration Workshop, "Randomized Numerical Linear Algebra" (RNLA), organized by Institute for Pure & Applied Mathematics at UCLA.

2023 Applied Mathematics skills Improvement for Graduate studies Advancement (AMIGAs), organized by Institute for Pure & Applied Mathematics at UCLA.

2019 CIMPA Research School on Dynamical Systems and Applications to Biology (Summer school of CIMPA), organized by University of Dhaka, Dhaka, Bangladesh.
Workshop on Infectious Disease Modeling, Systematic Reviews and Meta-analysis, organized by Global Public Health Research Foundation, Dhaka, Bangladesh.
WORKSHOP on PYTHON, organized by Dhaka University Science Society, Bangladesh.

Contributed Conference Presentations

2025 The 10th Annual Meeting of the SIAM Central States Section, held at the University of Arkansas, Fayetteville, Arkansas, USA.

2023 Arizona Women's Symposium in Mathematics (AWSiM) at Embry-Riddle Aeronautical University, Prescott, Arizona, USA.
AWM Pitt Grad Seminar, University of Pittsburgh, Pennsylvania, USA.

2022 International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems (ICMA-VIII), University of Louisiana at Lafayette, Lafayette, Louisiana, USA.

2019 4th Young Scientist Congress, Dhaka, Bangladesh.
21st International Mathematics Conference, University of Dhaka, Dhaka, Bangladesh.

2018 National Mathematics Conference, University of Dhaka, Dhaka, Bangladesh.

2017 20th International Mathematics Conference, University of Dhaka, Dhaka, Bangladesh

RELEVANT COURSES

Optimization | Stochastic Differential Equations | Computational Methods | Numerical Methods for PDE | Applied Linear Algebra | Applied Analysis | Applied Stochastic and Probability | Differential Equations | Theory of PDE

REFERENCES

Will be provided upon request