

# Kamrun Nahar Keya

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## EDUCATION

### Doctor of Philosophy, Major in Applied Mathematics

Expected August 2027

Arizona State University

Tempe, AZ, USA

- Conducting research on developing a low-rank matrix factorization method for streaming data.
- Collaborating on a project to develop an additive low-rank online matrix factorization.

### Master of Arts, Applied Mathematics

August 2024

Arizona State University

Tempe, AZ, USA

- Directed research on data-induced modeling of the *Tribolium confusum* population.

### Bachelor of Science, Mathematics

August 2017

University of Dhaka

Dhaka, Bangladesh

## 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).
- Guided graduate students with class work and facilitated assignments in graduate-level courses; Graded two graduate-level courses: PDE (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

|                              |                                                                                                                                                                                                                                                             |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Programming Languages</b> | : MATLAB   Python   Julia   FORTRAN   Mathematica   Machine learning.                                                                                                                                                                                       |
| <b>Technical Skills</b>      | : Microsoft Office suite (Word, PowerPoint, and Excel), Latex.                                                                                                                                                                                              |
| <b>Professional Skills</b>   | : Optimization, Numerical Simulation, Parameter estimation, Data-driven decision-making, Data visualization, Quantitative analysis, Leadership, Management, Organization, Presentation, Communication, Typing, 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

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### President

**April 2024 - Present**

Association of 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

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- Volunteered at the ASU open door in 2023 and 2025 at the Tempe campus to assist non-major people interested in mathematics, showcasing star individuals from mathematics.

- Volunteered at the ASU homecoming block party in 2023 and 2024 at the Tempe Campus by showcasing the mathematics department and its involvement.
- Volunteered in the 2023, 2024 and 2025 Graduate recruitment event by navigating new students about campus life and student life and presenting club information.

## **AWARDS & HONORS**

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- 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.
- 2018 Best Presenter award from the National Mathematics Conference, Bangladesh.
- 2017 Best Poster Award from the National Mathematics Conference held in Bangladesh.

## **CONFERENCES, WORKSHOPS, AND SEMINARS**

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### **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.
- 2019 Workshop on Infectious Disease Modeling, Systematic Reviews and Meta-analysis, organized by Global Public Health Research Foundation, Dhaka, Bangladesh.
- 2019 WORKSHOP on PYTHON, organized by Dhaka University Science Society, Bangladesh.

### **Contributed Conference Presentations**

- 2023 Arizona Women’s Symposium in Mathematics (AWSiM) 2023 at Embry-Riddle Aeronautical University, Prescott, Arizona, USA.
- 2023 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.
- 2019 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**

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