

Nurdan Kar, Ph.D.

PERSONAL

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EDUCATION

Doctor of Philosophy (Ph.D.) in Mathematics **Ankara, Türkiye**
Ankara University 2019 – 2025
Master of Science (M.Sc.) in Mathematics **Ankara, Türkiye**
Hacettepe University 2016 – 2018
Special Student (during M.Sc. at Hacettepe University) **Ankara, Türkiye**
Middle East Technical University (METU) Spring 2017

RESEARCH EXPERIENCES

Research Scholar **MD, USA**
University of Maryland, College Park Jan 2023 – Jan 2024
PhD Thesis Research
Developed Python code to solve a fractional partial differential equation to model glioblastoma growth. Attended the BIOL 708T (Theoretical Ecology) course.

RESEARCH INTERESTS

- Applied Mathematics
- Mathematical Biology (Disease Modeling)
- Stochastic Modeling of Biological Systems

FUNDING AND FELLOWSHIPS

- Centre International de Mathématiques Pures et Appliquées (CIMPA) Grant 2025
(€1000 travel grant + accommodation expenses)
- TÜBİTAK 2214-A International Research Fellowship for Ph.D. Students 2022
(\$21600 + travel expenses)

FUNDING FOR EVENTS

- Turkish Mathematical Society - MAD Fund for Mathematical Modeling Symposium 2025
(25000TL/\$650)

SOCIETY MEMBERSHIPS

- Society for Industrial and Applied Mathematics (SIAM) 2025 – present
- Association for Women in Mathematics (AWM) 2025 – present
- Society for Mathematical Biology (SMB) 2020 – present

PAPERS

- **Kar, N.** (2026). Fractional PDE modeling of glioblastoma spread on BrainWeb MRI images. In preparation.
- **Kar, N.** (2025). A comparative study of hypofractionated and standard fractionated radiotherapy in glioblastoma with two different growth patterns. In preparation.
- **Kar, N., Özalp, N.** (2024). A fractional mathematical model approach on glioblastoma growth: tumor visibility timing and patient survival. *Mathematical Modelling and Numerical Simulation with Applications*, 4(1), 66-85. <https://doi.org/10.53391/mmnsa.1438916>
- *Research Highlight: Introduced a novel mathematical model for glioblastoma growth.*
- **Kar, N.** (2023). Time-fractional quenching problem: Blow-up of $D_t^\alpha u$ at the quenching point. arXiv: 2306.07508 [math.AP].
- *Research Highlight: Proved the occurrence of blow-up in the time-fractional term at the quenching point.*

INVITED TALKS

II Encuentro Multidisciplinario de Ciencias Naturales y Exactas: Rosalind Franklin **Online**
Cayetano Heredia University (Peru) **13 Nov 2025**
Talk: Evolution of Mathematical Models of Tumor Growth

TALKS

Centre International de Mathématiques Pures et Appliquées Research School **Havana, Cuba**
University of Havana **10 Jun 2025**
Talk: Reaction-Diffusion Formalism for Glioma Growth

Departmental Seminar **Ankara, Türkiye**
İ.D Bilkent University **7 Apr 2025**
Talk: A Mathematical Model for Tracking Malignancy in the Human Brain

İzmir Mathematics Days VI **İzmir, Türkiye**
Yasar University **12 Sep 2024**
Talk: DTI-Based Mathematical Modeling of Glioma Invasion

Departmental Seminar **Online**
İ.D Bilkent University (Türkiye) **3 Sep 2024**
Talk: Mathematical Modeling of Glioblastoma Growth

Lightning Talks **Online**
DRP Türkiye 2024 **30 Jul 2024**
Talk: On Mathematical Oncology

15th Ankara Mathematics Days **Ankara, Türkiye**
Ankara Hacı Bayram Veli University **23 May 2024**
Talk: A Macroscopic-Scale Fractional Model for Glioblastoma Recurrence Monitoring

9th Workshop of Association for Turkish Women in Maths **İzmir, Türkiye**
İzmir University of Economics **03 May 2024**
Talk: A Fractional Mathematical Model for Macroscopic Dynamics of Glioblastoma Growth

Graduate Seminars III **Ankara, Türkiye**
Hacettepe University **23 Feb 2024**
Talk: Examining Glioblastoma Dynamics Through a Fractional Mathematical Modeling Perspective

Departmental Seminar (Host: Prof. Sridhar Hannenhalli) **MD, USA**
National Cancer Institute **03 Oct 2023**

Talk: Tracking Glioblastoma Recurrence: A Novel Prognostic Mathematical Model Approach

Monroe Martin Talks

University of Maryland

MD, USA

31 Mar 2023

Talk: Time-Fractional Order Modeling of Brain Tumor Dynamics

İzmir Mathematics Days I

Yasar University

İzmir, Türkiye

27 Jun 2018

Talk: Bäcklund Transformations of Nonlinear Partial Differential Equations

CONFERENCE ATTENDANCE (Selected)

SMB 2020 Annual Meeting

The Society of Mathematical Biology

Online

17 – 20 Aug 2020

Attendee

The 8th International Workshop on Differential Equations and Applications

Dokuz Eylül University

İzmir, Türkiye

02 – 04 Jun 2017

Attendee

TEACHING AND MENTORING

Instructor

Department of Mathematics, Bilkent University

Ankara, Türkiye

2024–present

• Course Coordinator (MATH 260)

• **Courses Taught:**

- MATH 260 – Introduction to Statistics (Spring 2026; 3 sections)
- MATH 230 – Probability and Statistics for Engineers (Fall 2025; 3 sections)
- MATH 106 – Introduction to Calculus II (Spring 2025; 2 sections, Summer 2025; 1 section)
- MATH 105 – Introduction to Calculus I (Fall 2024; 2 sections)

• Manage course content, deliver lectures, and design comprehensive assessments including examinations, homework sets, and quizzes.

• Supervise and mentor a team of Teaching Assistants to ensure instructional consistency across high-enrollment sections.

• Hold regular office hours and provide academic advising, guiding students on research opportunities and academic development.

Mentor

Hybrid

Directed Reading Program (DRP) Türkiye

Summers 2024–2025

• Mentored undergraduate students through structured reading and discussion on advanced topics, such as:

- Mathematical formulations of Waddington’s epigenetic landscape (**Bartu Gencer**, Boğaziçi University).
- Diffusion Tensor Imaging (DTI)-based approaches to modeling anisotropic cancer invasion pathways (**Beyza Nur Korkmaz**, Bursa Technical University).

• Supported students in understanding advanced literature and developing mathematical intuition.

• Assisted students in preparing and delivering presentations at a concluding in-person symposium, and accompanied them during their talks.

ACADEMIC EXPERIENCES

Participant & Speaker (Grant Awardee)

CIMPA & University of Havana

Havana, Cuba

9 – 20 Jun 2025

Research School

Attended lectures on mathematical models in biology and delivered a talk.

Participant

Fields Institute (Canada)

Online

Sep 2024 – Dec 2024

Thematic Program in Mathematical Oncology
Attended graduate courses in mathematical oncology.

Participant
Association for Turkish Women in Maths & METU
Summer School

Ankara, Türkiye
Jun 2024 – Jul 2024

Attended Numerical Analysis lecture covering topics such as Interpolation, Least Square Problem, Finite Difference Methods and Finite Element Method, held at Middle East Technical University (METU).

NOTABLE SKILLS

- **Grant Writing**
Successfully secured the TÜBİTAK 2214-A International Research Fellowship for Ph.D. Students for a one-year research project at the University of Maryland, MD, USA.
- **Project Management**
Independently developed and executed the research project, which was supported by TÜBİTAK.

COMPUTER SKILLS

- Technical \LaTeX , MS Office (Word/Excel/PowerPoint), Canva
- Programming Python (NumPy, SciPy, Matplotlib), Maple
- Environments Docker, Git, VS Code, Google Colab, Jupyter
- Bioinformatics Data analysis, Data visualization

SERVICE AND SCIENCE OUTREACH

- **Invited Panelist** | International Day of Women and Girls in Science, Bilkent University (2026)
- **Mentor** | Directed Reading Program Türkiye (2025)
- **Organizer** | Mathematical Modeling Symposium (2025)
- **Co-Coordinator** | Young Mathematicians Research Symposia Platform (2024 – present)
- **Founder** | Initiated and led the founding of the Young Mathematicians Research Symposia Platform in Türkiye with the support of Prof. Aslı Pekcan Yıldız from Hacettepe University.
- **Mentor** | Directed Reading Program Türkiye (2024)

LANGUAGE SKILLS

Turkish (Native), English (Advanced)

REFERENCES

Available on request