

Batuhan Bayır

Born: 14.09.1999, İzmir/Türkiye

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Education

3. **The University of Utah** (*Aug. 2023 — present*) — Ph.D. student in Mathematics
 - Advisors: Prof. Yekaterina Epshteyn and Prof. William M Feldman
2. **Ozyegin University** (*Sept. 2021 — July 2023*) — M.Sc. in Mathematics — CGPA is *3.90* over *4.00*
 - Thesis Title: Analysis of a fully discrete Fourier pseudospectral method for the Rosenau equation
1. **Ankara University** (*Sept. 2017 — June 2021*) — B.Sc. in Physics — CGPA is *3.63* over *4.00* — Rank: **1st** — 262/240 ECTS
 - Courses taken from the math dept. : Theory of Groups, Theory of Modules, Category Theory, Real Analysis Integral Equations, Differential Geometry, Differentiable Manifolds, Lie Groups, and History of Mathematics.

Publications

1. Batuhan Bayır, Yekaterina Epshteyn, and William M Feldman, Global Well-Posedness of a Nonlinear Fokker-Planck Type Model of Grain Growth, arXiv:2502.13151 — February 2025
2. Bootstrap 3 for Beginners (Yeni Başlayanlar İçin Bootstrap 3) — January 2015
 - Bootstrap 3 is modern CSS framework for developing mobile device friendly websites. I wrote Türkiye's first Bootstrap 3 book when I was a 15 years old. Published by KODLAB in 2015. Book comes with supplementary DVD. Sample video on YouTube: (click). First Edition: Jan. 2015, Second Edition: Nov. 2015. ISBN (Softcover): 9786059118026. Sample pages in Google Books: (click).
3. Hermitian Matrices as a Complex Vector Space (unpublished note) — July 2020
 - In this short note, I am proving there exists a *complex* vector space structure on a set of Hermitian matrices via *Axiom of Choice*. ResearchGate page of the note: (click).

Poster & Talks

1. Global Well-Posedness of a Nonlinear Fokker-Planck Type Model of Grain Growth
Given at:
 - 2025 SIAM Wasatch Student Chapters Conference, 12 April 2025, Utah State University
 - Applied Math Collective, 7 April 2025, University of UtahSlides: (click).

2. A Fourier Spectral Method for the Rosenau Equation — Horizons in non-linear PDEs Summer School, 26-30 September 2022, Ulm University, Germany
 - I presented the first few results of my master's thesis in the poster session of summer school. In my thesis, I propose a numerical scheme for the *Rosenau equation* and do a convergence and stability analysis of the proposed scheme. Poster: (click).
3. Tautochrone Curve and Integral Equations — 9th Bahar Mathematics Meeting, 1-2 May 2021, Zoom
 - I talked about integral equations, Laplace transform and Tautochrone curve. Video of talk: (click) and slide of talk: (click).
4. Mathematics of Minkowski Spacetime — 6th Bahar Mathematics Meeting, 19-20 October 2019, Hacettepe University and Ankara University MathCom Society Workshop, 10-11 July 2021, Zoom
 - I started with theory of bilinear forms, then I defined the Minkowski spacetime, and I proved some interesting geometric results on this space. Video of talk: (click) and slide of talk: (click).
5. Physical Aspects of Lie Theory — 5th Bahar Mathematics Meeting, 2-3 March 2019, İstanbul Bilgi University
 - I started with defining some concepts such as group and manifold, then I talked about how Lie groups and Lie algebras appeared in classical and quantum physics.
6. A Brief Introduction to Lagrangian Mechanics — 4th Bahar Mathematics Meeting, 13-14 October 2018, Middle East Technical University
 - I talked about variational problems and fundamentals of Lagrangian mechanics.

Attended Schools & Conferences

1. Horizons in non-linear PDEs Summer School, 26-30 September 2022, Ulm University, Germany
2. Conference on Mathematics of Wave Phenomena, 14-18 February 2022, *Online*
3. Computation, Analysis and Applications of PDEs with Nonlocal and Singular Operators, 4-11 February 2022, *Online*
4. Turkish Mathematical Society Undergraduate & Graduate Summer School, 2019, Nesin Mathematics Village
 - I took 1-week courses on Category Theory (Matteo Paganin) and Bernoulli Polynomials (Mehmet Cenkci), 2-week course on Differential Geometry (Özgür Kişisel & İlker Berktav).
5. Turkish Women in Mathematics Graduate Summer School, 17-26 June 2019, Middle East Technical University
 - In this school we discussed the first ≈ 80 pages of Harris' Algebraic Geometry book. Lecturer was Özgür Kişisel.
6. Middle East Technical University Math Society Workshops
7. 7th Cemal Koç Algebra Day, 27 April 2019, Bilkent University
8. Turkish Mathematical Society Undergraduate & Graduate Summer School, 2018, Nesin Mathematics Village

- I took 1-week courses on Ring Theory (Ali Negin), Lie Algebras (Şükrü Yalçınkaya), Manifolds & Special Holonomy (Özgür Kelekçi).

9. Negin Mathematics Village Winter School, 2018

- I took 2-week course on Module Theory (Ali Negin).

10. Negin Mathematics Village Summer School, 2017

- This summer school is offered for high-school students. I attended this school in my last year of high-school education. I took 2-week courses on Group Theory (Ali Negin) and Ring Theory (Salih Durhan).

Scholarships

- **Ozyegin University**, *Fellowship Package (Sept. 2021 — July 2023)*: Full tuition waiver, monthly net stipend, free dormitory room, and private health insurance.
- **Ozyegin University**, Travel grant for “Horizons in non-linear PDEs Summer School”.
- **Ulm University**, Accommodation support for “Horizons in non-linear PDEs Summer School”.

Teaching Experience

- *Fall 2023 and Fall 2024*: Lab assistant for **MATH2250** Differential Equations and Linear Algebra at the University of Utah.

Computer Skills

- HTML, CSS, and Bootstrap
- MATLAB and Python
- L^AT_EX
- Linux

Languages

- Turkish (Native)
- English
- Arabic