Yusuf Berk AKÇAY

Curriculum Vitae

Istanbul, Turkey — yusuf.akcay1@std.bogazici.edu.tr — https://yusufberkakcay52.github.io/

EDUCATION

Mathematics Major with Double Major at Physics
Current Year: 2^{nd} year
Institution: Boğaziçi University, Istanbul, Turkey
Current GPA: 4.00/4
Relevant Coursework
Information and Entropy, Computational Introduction to Dynamical Systems, Path Integral and Applications, Thermal Properties of Matter, Classical Mechanics I, Statistical Mechanics

RESEARCH INTEREST

I have a broad interest in modern aspects of theoretical and mathematical physics, especially in statistical mechanics, differential geometric formulations of classical and quantum mechanics, and dynamical systems. My Github page provides further details on my academic interests and work.

RESEARCH EXPERIENCE

PHYS 491: Introduction to Research in Physics 1 — September-December 2024
Supervisor: Asst. Prof. Ilmar Gahramanov

- Studied the Dunkl deformed quantum mechanics with an emphasis on the deformed Pauli oscillator.
- Learned about the Lewis-Riesenfeld Invariant and its uses to obtain exact solutions of the Schrödinger equation.
- Delivered a presentation on the topic to an undergraduate level audience.
- Investigated the possible supersymmetric extensions of the topic.

Course Project, PHYS 177: Computational Introduction to Dynamical Systems — July 2025

- Prepared a report on solvable structures and their relation to the Arnold-Liouville theorem.

Reading Program on Geometry of Quantization — September 2025 - Now
Supervisor: Asst. Prof. Umut Varolgüneş

- Learned about symplectic manifolds, Lagrangian submanifolds, Maslov index and related topics.
- Explored the symplectic geometric formulation of the classical mechanics, with a special emphasis on the Hamilton-Jacobi equation.
- Studied the WKB method to obtain approximate solutions of the Schrödinger equation, geometric interpretation of the WKB solutions and Maslov correction.
- Studied the geometric quantization of general symplectic manifolds.

SCHOOLS AND WORKSHOPS

Istanbul Stringy Meeting — 2024
COSMOVERSE@ISTANBUL 2025
Istanbul Technical University, Istanbul — 2025
Grad. and Undergrad. Summer Math School, Nesin Mathematics Village, Izmir, Turkey — 2025

- Category Theory
- Conformal Field Theory
- Selected Topics in Modern Physics

37th National Mathematics Symposium, Akdeniz University, Antalya, Turkey — 2025
Summer School on the Digital Archive of Exact Solutions in General Relativity
Istanbul Technical University, Istanbul — 2025

- Learned fundamental principles of general relativity, aiming to understand the Newman-Penrose formalism, Killing equation and its solutions.
- Used Sage-Math to perform calculations in Newman-Penrose formalism.
- Studied the Lie algebras, transformation groups in general relativity and their classification.

Istanbul Stringy Meeting — 2026

SKILLS

Languages: **Turkish**(native), **English**(fluent)
Computational Tools: **Python, Mathematica, LaTeX**

SCHOLARSHIPS

TUBITAK 2005 Undergraduate Scholarship