

# 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<sup>nd</sup> 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

## EXAMS

---

- Scored 500.00/500 on the LGS 2018 (High School Entrance Exam).
- Passed the TUBITAK Physics Olympiad 1<sup>st</sup> stage with a score of 10.25/25, thus earning the right to participate in the 2<sup>nd</sup> stage among 598 participants.
- Passed the TUBITAK Physics Olympiad 2<sup>nd</sup> stage with a score of 34.5/100, thus earning the right to participate in the 3<sup>rd</sup> stage among 56 participants.
- Admitted to Boğaziçi University with a score of 558.77668/560 on the YKS 2023 (Higher Education Institutions Examination).

## SKILLS

---

Languages: **Turkish**(native), **English**(fluent)

Computational Tools: **Python**, **Mathematica**, **LaTeX**

## SCHOLARSHIPS

---

**TUBITAK 2005** Undergraduate Scholarship

## EXTRACURRICULAR ACTIVITIES

---

- Licensed basketball player for 2 years.
- Licensed scout for 4 years.
- Organized voluntary lectures for high school students.