Hakan Bora Yavuzkara
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EDUCATION

Davidson College — **Davidson, NC**
B.S. Physics & B.S. Computer Science — **August 2024 - Expected May 2028**
• GPA: 3.98
• James B. Duke Scholar (Full Tuition), Chidsey Leadership Fellow, Wolfram Student Ambassador
• Coursework: Computational Physics, Physics I&II (+lab), Data Structures, Programming in the Humanities (Mathematica), Linear Algebra, Classical Mechanics, Modern Physics, Discrete Structures, Computer Organization, Electricity & Magnetism, Calculus III, Quantum Chemistry, Software Design, Independent Physics Research (Deep Learning for Nuclear Physics)

American Robert College of Istanbul — **Istanbul, Turkey**
Turkish High School Diploma & AP Courses — **August 2019 - June 2024**
• GPA: 96.14
• Coursework: AP Calculus BC, AP Statistics, AP Physics C: Mechanics and Electricity & Magnetism, AP Psychology, AP Art History, Introduction to Modern Physics, Introduction to Electronics

AWARDS & HONORS

Davidson College Sophomore CS Award — **May 2026**
DataFest Davidson Best Use of External Data — **April 2025**
Hack@Davidson Best AI Chatbot via OpenAI API — **Feb 2025**
International Astronomy and Astrophysics (IAAC) Competition Silver Honor — **Jul 2024**
Kadir Has University "Advanced Electricity and Magnetism", "Augmented Chemistry" and "Introduction to Quantum Mechanics" Outstanding Success — **Aug 2024**
ISBO Physics Olympiads 16th Place in Turkey — **May 2023**
Yusuf Durmuş Physics Camp High Honor Certificate (2nd Place) — **Jul 2021**

EXPERIENCE

Davidson College Data Cats — **Davidson, NC**
Consultant — **Aug 2025-Present**
• Provide data analytics and technical support in R, Python, and Mathematica to students
• Conduct one-on-one consultations and drop-in sessions, averaging 6 hours per week

Davidson College Center for Teaching and Learning — **Davidson, NC**
Physics Embedded Tutor/Computer Science Drop-in Tutor/Astronomy Grader — **Feb 2025-Present**
• Drop-in Tutor for Physics I&II and Computational Physics for 6 hours per week
• Selected as one of 4 Superhero tutors for the Spring 2026 semester for my work in Computational Physics.
• Embedded Tutor for Programming in the Humanities (Mathematica) class for 4 hours per week
• Grader for weekly homeworks in the Astronomy + Lab course for 4 hours per week

Davidson College ALPhA Research Group — **Davidson, NC**
Student Researcher — **Jun 2025-Present**
• Optimized the machine learning transformer models AdaPoinTr and Partial2Complete under the guidance of Dr. Michelle Kuchera and Dr. Ramanujan to reconstruct the Active Target Time Projection Chamber's recoded low-energy nuclear reaction tracks of ^{22}Mg+α and ^{16}O+α to improve the fitting algorithms for nuclear reactions
• Achieved F1 scores of .873 for ^{22}Mg+α and .947 for ^{16}O+α, comparing the error between the model prediction and ground truth point clouds
• Research is ongoing, and the plan is for the final version to be used in the Facility for Rare Isotope Beams at Michigan State University.

S3++ Summer Science Program — **Požega, Croatia**
Student Researcher — **Aug 2023-Sep 2023**
• Participated in the "Quantum Two-Dimensional Matter: An Application of Graphene" group to build a graphene transistor and work on the theory part: solved the time-independent Schrödinger equation for a double finite barrier to replicate a graphene transistor, and programmed a code for the probability density of the electron around the system to see if it mimics a semiconductor.
• Presented our goal and findings through a presentation to the rest of the program and gave background information about our research.

Sabancı University Applied Nanotechnology Summer School — **Istanbul, Turkey**
Student Participant — **Jul 2022-Aug 2022**
• Studied nanotechnology and recent scientific discoveries at Sabancı University, taught by a different professor in every class.
• Made a battery, a super resistor, and conducted a redox reaction experiment.
• Visited one of the only cleanrooms in Turkey and learned the process of making nanomaterial through multiple demonstrations.

PUBLICATIONS & PRESENTATIONS

Poster Presentation "Transformers for Track Completion" SPSCon 2025 **Nov 2025**
Oral Presentation "Transformers for Track Completion" Division of Nuclear Physics Conference 2025 **Oct 2025**
Poster Presentation "Transformers for Track Completion" at Davidson College Fall Research Symposium **Sep 2025**
Poster Presentation "Transformers for Track Completion" at FRIB in Michigan State University **Jul 2025**

VOLUNTEER EXPERIENCE

Newtons of the Future **Istanbul, Turkey**
Founder, Co-Leader **Sep 2022 - Dec 2022**
• Co-led original project which explored the basics of physics with 5th and 6th graders in Piri Reis Secondary School
• Explored physics with a 6 classes of 15, for 6 hours per day on weekends
• Gathered 11 volunteers from my high school for each class to have 2, and explored with a class myself.
• Created a curriculum that included a different physics subject (energy, motion, electricity, matter, pressure, etc.) each week
• Ended each day with a general physics experiment relevant to the topic of the day, including springs, projectile motion, friction, or electric circuits

CAMPUS INVOLVEMENT AND LEADERSHIP

Davidson College Society of Physics Students **Davidson, NC**
President **Aug 2025-Present**
• Lead SPS chapter of 210 members: raised $
• Organize Space Day (November 2025), and Star Party (February 2026)
• Volunteer at 2024-2025 Star Party (70+ attendees) and Ice-Cream Socials (40+ attendees)

Davidson College Hack@Davidson **Davidson, NC**
Logistics Team Member **Aug 2025-Present**
• Created PowerPoints that showed the strengths and weaknesses of individual players using advanced statistics

Davidson College Games Club **Davidson, NC**
Chess Team Co-Leader **Aug 2025-Present**
• Co-leading Davidson A chess team in PlayVS College League

Davidson College CATS' STATS **Davidson, NC**
Basketball Player Scout, Data Engineering Team Leader **Oct 2024-Present**
• Created PowerPoints that showed the strengths and weaknesses of individual players using advanced statistics

Robert College Astronomy Club **Davidson, NC**
Co-President (2023-2024) **Sep 2020-May 2024**
• Designed and printed the school's astronomy article, *Orion,* in 2022 and 2023.
• Helped build a solar filter for the school's telescope, later used for astrophotography.
• Proposed a project for a permanent telescope shed in the school campus.
• Led weekly gatherings based on discussing astronomy, doing introductory learning, and writing articles for *Orion.*

SKILLS

• Languages: Turkish (Native), English (Advanced Academic: DET 150/160, SAT 1510/1600), Japanese (Basic)
• Technical Skills: Java, Python, PyTorch, TensorFlow, Pandas, Mathematica, Git, Gaussian, R