SANABHI GAURAW

+1 (214)-603-5606 ⋄ sanabhigauraw@berkeley.edu

EDUCATION

B.S. Electrical Engineering & Computer Science, B.A. Physics August 2026 – May 2030 (Expected)
University of California, Berkeley, Berkeley, CA

Plano East Senior High School, Plano, TX Graduated May 2026

- Rank: 4/1300
- GPA: 4.83/5.00
- SAT: 1560 (770/790)

RESEARCH

Acoustic Wave Propagation Research (NSF EFRI NewLaw Grant) – University of North Texas
Cited Contributor, Data Collector

Principal Investigator: Dr. Arkadii Krokhin

· Developed a COMSOL model of acoustic pulse propagation through glycerine and other high-viscosity fluids, focusing on time-delay effects and impedance shifts.
· Designed a fluid-embedded test system for measuring bulk modulus and impedance for non-destructive imaging, inspired by prior work in elastic bulk modulus elastography.
· Presented findings to physics faculty and at TJAS, TJSHS, and TXSEF.

Scintillator Calibration – Lawrence Berkeley National Laboratory (URAP) August 2026 - Present
Undergraduate Researcher

Principal Investigator: Dr. Bethany Goldblum

· Calibrated a scintillator detector for the LBNL nuclear physics lab, using radioactive sources to measure energy deposition and light yield.
· Developed ROOT macros to automate data collection and analysis, improving efficiency and accuracy of fit of simulated data onto experimental data.
· Presented findings to the Bay Area Neutron Group.

PROJECTS

PHYSICA-X: Web Toolkit for Interactive Physics Lessons | Bun, PostgreSQL, TypeScript, TailwindCSS

· Built a frontend and backend that lets registered teachers create and publish simulation-based lessons to a shared database accessible to any student.
· Deployed in the Plano Independent School District; used in school classrooms.

RTL-to-Layout ASIC Implementation | Verilog, Open-Source EDA

· Designed and synthesized Random Number Generator in Verilog, taking it from RTL through technology mapping to physical implementation with an open-source EDA toolchain.
· Analyzed static timing reports to find critical paths and evaluate setup-time constraints and timing-versus-area trade-offs.
· Compared two implementation configurations, documenting changes in area, critical-path delay, and power consumption.

CPU Cache and Performance Simulator | C++

· Built a cache simulator with configurable capacity, associativity, line size, and replacement policies (LRU, FIFO).
· Analyzed memory-access traces across different workloads to quantify hit/miss rates and estimated memory-access cost.
· Writing a trace-driven harness to measure hit/miss rates across workloads.

Monte Carlo Simulation Engine | C++, OpenMP, Python

· Building a modular C++ Monte Carlo engine for stock-price simulation with reproducible random sampling, error estimation, and variance reduction.
· Adding OpenMP parallelism and benchmarking on an Apple M5 Pro; validating against analytical solutions.
· Validated accuracy against analytical solutions and reported throughput and confidence intervals.

FPGA Traffic-Light Controller | VHDL, Digilent S7 FPGA
PLTW Digital Electronics

· Designed and implemented a VHDL traffic-light controller on a Digilent S7 FPGA, modeling signal sequencing and transitions with digital logic.
· Optimized the controller's state-transition logic to streamline the control algorithm while preserving the required traffic-light sequence.

TECHNICAL SKILLS

Languages	C++, Python, Verilog, CUDA, VHDL
Tools	ROOT, COMSOL, open-source EDA flow, LaTeX, MATLAB

RELEVANT COURSEWORK

CS 61A	Structure and Interpretation of Computer Programs
CS 70	Discrete Mathematics and Probability Theory
ELENG 66	Introduction to Signals, Dynamics, and Information
PHYS 7B	Physics for Scientists and Engineers
CS 61B	Data Structures
CS 61C	Computer Architecture
(H.S.) PLTW Digital Electronics	Digital Logic Design and Implementation

HONORS & ACTIVITIES

- National Science Bowl, High School Team Captain / Vice Captain — March 2024, 2025, 2026
- U.S. National Chemistry Olympiad, National Exam Qualifier — March 2025
- U.S.A Physics Olympiad, National Exam Qualifier — March 2025
- A.I.M.E Qualifier — November 2024
- Texas Robotics UIL State Champions — March 2025
- FIRST Robotics Competition Global Championship Qualifier — March 2025
- Texas Science and Engineering Fair — March 2023
- Invitation to Present at the Texas Junior Academy of Sciences — October 2023, 2024, 2025
- Invitation to Present at the Texas Junior Humanities and Science Symposium — February 2024, 2025