Charles (Charlie) Sowerby

PHONE: (773)-698-1449
EMAIL: charlie.sowerby@gmail.com
WEBSITE: charlie.sowerby.com

Education

June 2021 (Expected) — **University of California, Los Angeles** - Bachelor of Science
Majors: Physics (B.S.) & Mathematics (B.S.)

GPA: 3.72/4.00

Technical Coursework: Nuclear Physics Laboratory, Electronics for Physics Measurement

Honors: College Honors (2017-Present), Deans Honors List (Fall 2017, Winter 2020 - present)

June 2017 — University of Chicago, Laboratory Schools (High School)

Technical Skills

Technical	Circuit design, Soldering, Raspberry Pi/Arduino Programming, Computer Aided PCB Design
Equipment	Oscilloscope, Pulse Generator, DMM, etc.
Computer	Python, C++, LaTeX, Mathematica, Matlab, HTML/CSS, Microsoft Office
Mathematical	Numerical solving of systems of partial differential equations

Research and Lab Experience

For more information on my research visit my website

Aug-Now 2020 — **Eigenmode Solver**
Basic Plasma Science Facility, UCLA
- Reformulated a simplified electrostatic version of the Braginskii two-fluid equations to include electromagnetic corrections.
- Modified an existing linear eigenmode solver to incorporate the derived corrections and used the finite difference method to numerically solve these PDE's.
- Implemented this eigenmode solver to simulate plasma turbulence in the Large Plasma Device at UCLA and compared it with actual data.

Mar-Aug 2020 — **Plasma Imaging**
Basic Plasma Science Facility, UCLA
- Programmed inexpensive Raspberry Pi/Arduino Camera Modules to capture images of plasmas on timescales of less than 100ns.
- Experimentally determined the best hardware and method for capturing images with minimal latency and jitter using a Pulse Generator.

Mar-Jun 2019 — **Relay Circuit**
Basic Plasma Science Facility, UCLA
- Designed and soldered my own remotely controlled relay circuit to be used for adjusting resistors in a Langmuir Probe
- Programmed a Raspberry Pi to control the circuit and implemented a network socket connection to the lab computer for easier control.
- Modeled a digital PCB using Altium's CircuitMaker to be printed to minimize physical space occupied by the circuit.

Academic Experience

Mar-Oct 2020 — Independent Study in Smooth Manifolds
UCLA Mathematics
Studied graduate-level Smooth/Riemannian Manifolds with the help of UCLA graduate student Nicholas Boschert, using texts by John Lee: *Introduction to Smooth Manifolds* and *Riemannian Manifolds* as reference.

Winter 2020 — Undergraduate Grader
Physics 131A
Graded homework assignments for upper-division class Physics 131A: Mathematical Methods in Physics.

Spring 2019 — Peer Reviewer
Undergraduate Science Journal, UCLA

Other Skills

Languages — Conversational German