Charlie Sowerby

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Education

June 2021	**University of California, Los Angeles** - Physics (B.S.) & Mathematics (B.S), GPA: 3.72/4.00
	Technical Coursework: Modern Physics Lab, Nuclear Physics Lab, Electronics Lab, etc.
	Honors: Highest Honors in Physics (Departmental Honors), College Honors Program

Technical Skills

Technical	Circuit design, Soldering, Raspberry Pi/Arduino Programming, Computer Aided PCB Design
Equipment	Oscilloscope, Pulse Generator, Multimeter
Languages	Python, C++, LaTeX, Mathematica, HTML/CSS
Mathematical	Numerical methods for differential equations (coupled PDE's in particular)

Technical Research and Lab Experience

For more information on my research projects visit my [website](http://charlie.sowerby.com)

Aug-Jun 2021 — **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 more accurate drift waves in the Large Plasma Device at UCLA.

Mar-Aug 2020 — **Plasma Imaging**
Basic Plasma Science Facility, UCLA
- Programmed Raspberry Pi/Arduino Camera Modules in an attempt to capture images of plasmas on timescales of less than 100ns.
- Experimentally determined which combination of hardware and software on these inexpensive devices was able capture images with the least latency and jitter using a pulse generator and flashing LEDs.

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.

Theoretical or Academic Experience

June-Now 2021 — **Independent Study in Fourier Theory**
University of Chicago Mathematics
Studying Fourier Series, Integrals, and Complex Function Theory with the help of UChicago professor [Carlos Kenig](#)

Mar-Oct 2021 — **Independent Study in Riemannian Geometry**
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**
UCLA Physics & Astronomy
Graded homework assignments for upper-division class Physics 131A: Mathematical Methods in Physics. Some of the topics discussed were Linear Algebra, PDEs, Fourier Series, Green's Functions, Bessel Functions, and Cauchy's Integral Theorem for complex functions.

Other Skills and Interests

Languages	Conversational German
Interests	Chess, Gardening, Distance/Cross Country Running