Henry Olling

email | linkedin | github | website

Education

Master of Science in Atmospheric Science — Fort Collins, CO
Colorado State University — *Jun. 2024 – Anticipated Jun 2026*

Bachelor of Science in Astrophysics — Santa Cruz, CA
University of California, Santa Cruz — *Sept. 2018 – Jun 2023*

Bachelor of Science in Environmental Science — Santa Cruz, CA
University of California, Santa Cruz — *Sept. 2018 – Jun 2023*

Experience

Graduate Research Assistant — Jun 2024 - Present
Colorado State University, Atmospheric Science — *Fort Collins, CO*

- Leveraged machine learning techniques for equation discovery
- Currently using Python and other data-science tools to analyze the maintenance and propagation of the Madden-Julian Oscillation

Undergraduate Researcher — Fall 2019 - Summer 2023
University of California, Santa Cruz, Earth and Planetary Sciences — *Santa Cruz, CA*

- Thesis project involved cloud microphysics, analysis of CFD data and computationally intensive simulations
- Developed Python scripts and C programs to analyze various large datasets (e.g. subsets of NASA's IMERG)

Undergraduate Researcher — Fall 2022 - Summer 2023
University of California, Santa Cruz, Astrophysics — *Santa Cruz, CA*

- Thesis title: "Impact of Diffusivity Profiles in Water Clouds for Jupiter"
- Extended an existing microphysical model written in FORTRAN
- Performed data analysis with Python using the "matplotlib", "numpy", and "pandas" packages

Undergraduate Researcher — Spring 2023 - Summer 2023
University of California, Santa Cruz, Earth and Planetary Sciences — *Santa Cruz, CA*

- Improved and updated the climlab climate modelling software
- Developed working implementations of climate processes
- Diagnosed and solved complex bugs in both Python and FORTRAN
- Tracked versions, progress, and issues and submitted bug reports and pull requests using Github

Teaching Assistant — Jan 2023 - Apr 2023
University of California, Santa Cruz, EART124: Modelling Earth's Climate — *Santa Cruz, CA*

- Complete assessments of student work at the direction of Professor Feldl
- Host discussion sections, and write and present lectures
- Host office hours for 1-on-1s with students

Student Assistant — Sept 2021 - Nov 2022
California Air Resources Board — *Remote*

- Produce and update Python scripts to handle aggregation and de-aggregation of data
- Contributed to multiple internal tools for processing and visualizing environmental data

Intern, Development and Data Visualization — Summer 2019
California Department of Water Resources Bay Delta Office, Modelling Support Branch — *Sacramento, CA*

- Produced Python scripts to visualize data with the use of common place graphing libraries
- Contributed to internal software packages pertaining to data visualization
- Contributed to and tested publicly available software package used for reading of HEC-DSS data files (pyhecdss)

Intern, Data analysis and Visualization — Summer 2018
California Department of Water Resources Bay Delta Office, Modelling Support Branch — *Sacramento, CA*

- Produced demonstration materials for data visualization with Tableau.
- Processed data for research purposes using a custom data processing tool written in C++ that I developed.

- Presented our research during the poster session of the 2018 Bay Delta Science Conference.

Intern, Water Data Visualization Trainer Summer 2017

California Department of Water Resources Bay Delta Office, Modelling Support Branch *Sacramento, CA*

- Produced training materials (PDFs, sample Excel, Tableau, and Word files) for using Tableau for specific water data visualizations with Tableau.
- Presented weekly training to senior engineers on using Tableau for water-specific visualizations.
- Successfully presented department-wide demonstration of Tableau's possible uses.

Projects

Climlab | *Github, CI, Python, numpy, FORTRAN* Jan 2023 – Jun 2023

- Contributed new features and bug fixes to an existing codebase.
- Collaborated with experts to replicate and build upon existing modelling techniques.
- Wrote Python modules, new unit tests, and debugged FORTRAN.

High Performance EBM | *C, OpenGL (GPGPU)* May 2023 – Jun 2023

- A high-performance energy balance model designed to run entirely on the GPU.
- Useful for high temporal and high spatial resolution models and supports a number of simple processes.

A Pythonic Tool for Modelling Physical Systems | *Python* March 2022 – April 2022

- Replicates the functionality of Insight Maker within the context of a python script.
- Designed for modeling and basic visualization of simple physical systems.

2D Fluid Dynamics & Stochastic Reaction Simulation | *Python* June 2021

- Wrote and coupled implementations of the Lattice-Boltzmann fluid simulation and the Gillespie stochastic chemistry simulation.
- Simulates flows of chemicals through two-dimensional pipes and supports arbitrary reagents and reactions.
- Completed for a final project in a numerical methods course in physics, recieved a 109%.

Custom Multiplayer Game Engine | *C++, OpenGL, ASIO, GLFW3, BulletPhysics* Nov 2020 – Present

- Intermittently developing a functioning multiplayer game engine in C++ using OpenGL.
- Working integration with BulletPhysics for in-game physics simulation
- Uses ASIO as a compatibility layer for networking and libsodium for secure end-to-end encryption.
- Uses a custom-made deferred renderer for 3D assets alongside a custom-made 2D renderer for GUIs and sprites.
- Uses MySQL database to track player authentication data and player stats.

8-bit Zilog Z80 Computer | *Kicad* May 2015 – May 2016

- Designed a custom 8-bit computer around the Zilog Z80 CPU using 7400 series logic
- Built circuitry using a mixture of wire-wrapping and soldering
- Wrote and hand-assembled a test program

Technical Skills

Languages: C/C++, Python, FORTRAN, Java, HTML/CSS, GLSL, SQL
Developer Tools, Frameworks, & Paradigms: jupyter notebook, Git, Eclipse, MPLABX, ChipKit Development Tools, Make, CodeBlocks, bash, MySQL, Flask, Bootstrap, GPGPU Computing, Compute Shaders, Multithreading
Libraries: pandas, NumPy, Matplotlib, OpenGL, ASIO, FFTW, OpenMPI

References

References availiable upon request