Katherine Gruenewald

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437 Elk Trail
Lafayette, Colorado

EDUCATION

CU Boulder, Boulder, CO
Master of Science, Materials Science and Engineering, January 2020 - May 2022
SUNY Polytechnic, Albany, NY
Bachelor of Science, Nanoscience, September 2013-May 2017

TECHNICAL BACKGROUND

Programming: Julia (3 years - most of my coursework/research), Rust, python
Visualization: Makie.jl (Julia GPU-powered plotting and animation)
Data science: Flux.jl (Julia ML library), Dataframes.jl/pandas
Cloud: AWS ECS/EC2 (for cloud-based GPUs).

RESEARCH EXPERIENCE

Graduate research assistant — Prof. Andres Montoya-Castillo
May 2021 - August 2021 — CU Boulder, Chemistry Department

Investigated spectroscopic models for the Fenna-Matthews-Owen photosynthetic complex of deep sea bacteria to understand its dynamical spectroscopic behavior.

Graduate research assistant — Prof. Orit Peleg
May 2020 - December 2020 — CU Boulder, Computer Science Dep.

Examined mechanical stability of simulated bee swarms to oscillatory perturbations with an aim to understand wider adaptive collective behavior for applications in swarm robotics and active materials.

Research aide — Prof. Mengbing Huang
November 2015 - October 2017 — SUNY Polytechnic, Ion Beam Laboratory

Performed materials characterization on hafnia mirror samples for Lawrence Livermore National Laboratory's National Ignition Facility. Led investigation as part of my undergraduate capstone research into implanting and performing X-ray photoelectron characterization of a niobium-doped molybdenum disulfide sample which resulted in a publication in MRS Advances.

TEACHING EXPERIENCE

Chemistry/biology laboratory TA — Chemistry/Ecology and Evolutionary
August 2020-December 2021 (3 semesters) — Biology Department, CU Boulder

Oversaw the remote/hybrid laboratory instruction of two sections each of a general and engineering chemistry laboratory as well as a general biology laboratory. In parallel, taught two hybrid general chemistry recitation sections.

RELEVANT PROJECTS

Interactive molecular dynamics of polymer strain Implemented a velocity-verlet integrator in Julia to investigate polymer network dynamics under interactively defined strains.

Incompressible navier-stokes solver Built a finite difference solver in Julia to visualize the flow of a viscous, incompressible fluid in a coupled flow regime.

https://github.com/kathesch/FiniteDifferenceFlowDemo.jl