

Calvin Sprouse

Curriculum Vitae/Resume

Physics Ph.D. Fall 2024

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EDUCATION

Central Washington University, Ellensburg, Washington

B.S. Physics

Minors in Astronomy and Mathematics

September 2020 | June 2024

Cumulative GPA: 3.73/4.00

RESEARCH EXPERIENCE

Development of a Magneto Caloric Testing Apparatus

CWU

Undergraduate Student Researcher, Research Advisor: Dr. Benjamin White (CWU Physics)

September 2023 |

Present

- Developed software in Python for an Arduino controlled measurement device.
- Research sampling material for device calibration.
- Wrote funding proposals based on designs and future testing requirements.

Computational Models of Neuronal cytoskeleton

CWU | NSF RUI

Undergraduate Student Researcher, Research Advisor: Dr. Erin Craig (CWU Physics)

June 2022 | Present

- Develop computational models on the mechanics of the neuronal Cytoskeleton in MatLab.
- Developed data visualizations in Python.
- Presented work at six research conferences including the Biophysical Society.
- Made posters and presentations for conferences.
- Wrote user guides and kept a lab notebook documenting procedures.
- Work supported by NSF RUI award 1915477.

Calculating the Energy of IceCube Neutrino 190331A

University of Wisconsin-Madison (UWM) | NSF REU

Astrophysics REU Student, Research Advisor: Dr. Lu Lu (UWM Physics)

May 2023 | August 2023

- Developed Monte Carlo simulations for calculating neutrino energies.
- Worked with IceCube data.
- Learned to work within IceCube data analysis protocols.
- Learned to work with large research teams and follow data handling procedures.
- Presenting work at the American Astronomical Society.

Characterization of CWU 0.6m Telescope Precision

CWU

Undergraduate Student Researcher, Research Advisor: Dr. Cassandra Fallscheer (CWU Physics) March 2022 | June 2023

- Created and executed methods to reliably measure variable stars.
- Wrote Python scripts to automatically control a research telescope.
- Wrote Python scripts to preform data analysis on hundreds of observations.
- Presented this research at two research conferences.

Construction of a new Spectrograph for the CWU 0.6m Research Telescope

CWU

Undergraduate Student Researcher, Research Advisor: Dr. Cassandra Fallscheer (CWU Physics) September 2022 | June 2023

- Programmed data reduction notebooks in Python for an under construction spectrograph.
- Researched data analysis methods for using spectrograph data.

TALKS AND PRESENTATIONS

American Astronomical Society 243rd Meeting Poster

Sprouse et. al. (2024). The Highest-Energy Astrophysical Muon-Neutrino: 190331A. American Astronomical Society 243rd Meeting.

Murdock College Science Research Conference 2023 Poster

Sprouse et. al. (2023). Characterizing the magnitude discrimination limit of the CWU 0.6m Research Telescope. Murdock College Science Research Conference 2023.

Washington American Association of Physics Teachers Meeting 2023 Poster

Sprouse et. al. (2023). Computational Models of Self-Organization of Neuronal Cytoskeleton.

CWU Symposium for Undergraduate Research and Creative Expression 2023 Poster

Sprouse et. al. (2023). Characterizing the magnitude discrimination limit of the CWU 0.6m Research Telescope. Symposium for Undergraduate Research and Creative Expression 2023.

CWU Symposium for Undergraduate Research and Creative Expression 2023 Presentation

Sprouse et. al. (2023). Organization of Neuronal Cytoskeleton. Symposium for Undergraduate Research and Creative Expression 2023.

Biophysical Society Meeting 2023 Poster

Craig et. al. (2023). Self-organization of the microtubule cytoskeleton in developing axons. Biophysical Journal Abstract, doi.org/10.1016/j.bpj.2022.11.1506

Murdock College Science Research Conference 2022 Poster

Sprouse et. al. (2022). Development of Visual Animations to Study the Physics of Neurons. 31st Annual Murdock College Science Research Conference.

Physics Congress 2022 Poster

Sprouse et. al. (2022). Computational Models of Self-Organization of Neuronal Cytoskeleton. 2022 Physical Congress.

TEACHING EXPERIENCE

CWU Department of Physics

Learning Assistant (LA) for PHYS 181 Introductory Physics with Lab

Ellensburg, Washington
September 2023 | Present

- Worked in the classroom to assist with labs.
- Graded student assignments and provided feedback.
- Provided explanations to students in class on lecture material.
- Read and discussed physics teaching literature as part of an accompanying class.

CWU Learning Commons Math Center

Lead Tutor

Ellensburg, Washington
September 2022 | Present

- Work with students by drop-in or appointment on math issues in any STEM course.
- Reinforce study habits with a focus on math concepts.
- Develop and give trainings to fellow tutors according to CRLA standards.
- Collect and analyze data on the center to increase tutor effectiveness and request funding.

CWU Learning Commons Peer Assisted Learning Center

Physics Tutor

Ellensburg, Washington
September 2022 | Present

- Provide individual and group help to students in any physics course.
- Reinforce study habits with a focus on physics concepts.
- Create session plans targeted to introductory physics students.
- Regularly interact with professors of introductory classes to advertise and discuss upcoming coursework.

CWU Department of Physics

Peer Teacher for PHYS 303 Observational Astronomy

Ellensburg, Washington
March 2023 | May 2023

- Developed astronomy focused lesson plans for a quarter long course.
- Taught lessons using a planetarium.
- Taught students how to identify constellations and use celestial coordinate systems using only their eyes.
- Evaluated students throughout the quarter.
- Led observational sessions and mentored students doing research on the CWU research telescope.

CWU Northwest Earth Space Science Pathways (NESSP)

Student Office Assistant

Ellensburg, Washington
September 2022 | June 2023

- Created robotics curriculum for K-12 student teams.
- Hosted week-long overnight summer camps for high school students.
- Engaged student teams in engineering challenges mimicking a NASA Mars sample return mission.
- Encouraged students to connect a variety of skills in engineering, programming, teamwork, and planning.

Snoqualmie Valley School District After-School Robotics Instructor

Instructor

North Bend, Washington
2013 | 2020

- Taught K-12 students skills in teamwork, leadership, engineering, programming, and project management.
- Mentored competitive FIRST student teams.
- Coordinate with other student teachers to provide classes to an entire school district.

LEADERSHIP EXPERIENCE

CWU Astronomy Club

President

September 2023 | Present

- Run weekly meetings and set agenda.
- Engage with members to gauge club goals and research club interests.
- Train members on using and giving planetarium shows.
- Host regular public planetarium shows for community members.
- Write travel and funding requests for student interests.
- Make experiences available to students including the 2023 October eclipse.
- Engage with local astronomy research including visits to LIGO.
- Engage with local schools to run planetarium shows or bring astronomy equipment.
- Participate in advertising events for college and department.

CWU Astronomy Club

Treasurer

September 2022 | June 2023

- Balance budget and write funding requests.
- Handle donations and funds raised.
- Research school finance guidelines.

CWU Society of Physics Students (SPS) Chapter

Secretary

September 2022 | June 2023

- Keep regular meeting notes on agenda.
- Manage club email and schedule.

NASA Student Launch Challenge: Wildcat Rocketry Team

Safety Officer

September 2022 | June 2023

- Handle regular communications with NASA.
- Create safety guidelines according to the National Association of Rocketry safety standards.
- Enforce safety guidelines during all club activities.
- Work with division leaders to ensure safe operation and construction of rocket components.

Mount Si High School (MSHS) Robotics Club

President

September 2016 | June 2020

- Manage outreach activities of three competitive teams.
- Work with instructors to get students access to power equipment.
- Enforce student safety during meetings and competition.
- Host annual, state-wide, competitions through volunteer recruitment.
- Coordinate the creation of a school-district wide after school robotics program for K-12 students.
- Engage with community members at science fairs and other community stem showcases.

MSHS FIRST Robotics Team: Si Borgs

Team Captain

September 2016 | June 2020

- Work with division leads to coordinate the development of a competitive robot in a timely manner.
- Schedule outreach activities and coordinate engagement with other teams.
- Encourage gracious professionalism in and out of the club.

ADDITIONAL COURSEWORK

- PHYS 292 Exploring Physics Teaching
- MATH 260 Sets and Logic
- MATH 314 Probability and Statistics

HONORS AND DISTINCTIONS

Sigma Pi Sigma Department Nomination

Nominated for academic excellence, quality of research, volunteer service to the department, and community engagement.
2023

CWU Department of Physics

June

FIRST WA Deans List Semi-Finalist

Mount Si High School

This award recognizes a student who, by the nomination of their team members and mentors, are excellent examples of student leaders who have led their teams and communities to an increased awareness of FIRST and its mission. These students have also achieved personal technical expertise and accomplishment.

SKILLS AND CERTIFICATIONS

- Python for scripting, simulations, and data science; MatLab; Mathematica; Git; GitHub; L^AT_EX.
- Dassault Systemes certificate of Mechanical Engineering in Solidworks.