LUC BARRETT

Experimental Physicist - Amherst, MA
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EDUCATION

Bachelors of Science - Physics, University of Massachusetts - Amherst — Expected 2024
Major GPA: 3.95 | Minor in Mathematics | Commonwealth Honors Scholar
Relevant Coursework: Quantum Computation, Quantum Mechanics, Classical Mechanics, Electrodynamics, Statistical Mechanics, Computational Physics, Calculus I-III, Differential Equations, Linear Algebra, Nonlinear Dynamics and Chaos

Bachelors of Science - Computer Science, University of Massachusetts - Amherst — Expected 2024
Major GPA: 4.0
Relevant Coursework: Quantum Algorithms, Artificial Intelligence, Applications of Natural Language Processing, Computer Systems Principles, Data Structures & Algorithms, Reasoning Under Uncertainty, Intro. to Computation

SKILLS

Languages	Python, C, C++, Javascript/Typescript, Julia, Java, Kotlin
Tools & Frameworks	Numpy, Tensorflow, Pandas, ROOT, Geant4, Slurm, Nginx
Software	Git/Github, Linux, VSCode, Fusion360, Cura, VSCode, PyCharm

EXPERIENCE

Research Assistant - nEXO: Search for neutrinoless double beta decay ($0\nu\beta\beta$) — May 2023 -
University of Massachusetts - Amherst Department of Physics — *Amherst, MA*
Working in Prof. Kumar's and Prof. Pocar's labs working on research and developement projects for the nEXO experiment
Projects have included:

- Setting up and calibrating the signal processing chain to be used with a laser-driven in-situ electron lifetime monitoring system
- Performing a thermal analysis on the liquid xenon cell to measure cooling power of the liquid nitrogen and heat leak
- Support and development of in-house data analysis packages

Research Assistant - MOLLER: Measurement of the parity-violating asymmetry in electron-electron scattering — May 2022 -
University of Massachusetts - Amherst Department of Physics — *Amherst, MA*
Working in Prof. Kumar's lab studying fundamental symmetries, developing the MOLLER experiment.
Projects have included:

- Creating high-performance software to identify potential sources of secondary background sources in the MOLLER apparatus.
- Designining an algorithm to smooth a simulation-generated contour curve of the electron signal profile without losing critical details
- Set up, configure, and manage a high performance compute cluster running Ubuntu and Slurm to run simulations and perform data analysis with Geant4 and ROOT

Teaching Assistant — Aug 2021 - May 2022
University of Massachusetts - Amherst Department of Physics — *Amherst, MA*

- F21: PHYS181: Intro to Mechanics - Introduction to the major, students learn calculus-based classical mechanics. Taught under Prof. Narayanan Menon
- S22: PHYS281: Computational Physics - Python based course for students to learn numerical methods and data analysis. Taught under Prof. Stephane Wilocq

HONORS & AWARDS

LeRoy F. Cook, Jr. Memorial Award: Presented to undergraduate physics majors for academic excellence

Phi Kappa Phi: Invite-only honor society admitting the top 7.5% of the junior class

EXTRA-CIRRICULAR ACTIVITIES

- Currently a part of the physics Peer Mentoring program, where we are assigned a first-year student to help guide them through the major and provide support
- Ambassador for the Society of Physics Students, a student organization providing social and academic support to physics and astronomy majors across the campus