CURRICULUM VITAE

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(a) EDUCATION

University of Cincinnati	*Cincinnati, OH*	Physics	Ph.D 2025-Present
University of Maryland	*College Park, MD*	Physics	B.S. 2025
Montgomery College	*Rockville, MD*	Mathematics	A.S. 2022

(b) RESEARCH EXPERIENCE

2024 – 2025 Lab Assistant, ***University of Maryland - LHCb Flavor Physics Group***

- Assessed and developed linearity tests for Photo-Multiplier Tubes (PMTs) relevant to R& D for the Large Hadron Collider beauty (LHCb)'s ECAL Upgrades Ib and II. Advised by Prof. Phoebe M. Hamilton.
- Acquired data from enclosed test-benches consisting of multi-anode and single-anode PMTs, receiving pulses of light from a class III laser with two alternating optical density (OD) filters.
- Developed a script in python to arrange the data in order of intensity of the amplitudes of the intensities of the laser pulses, then statistically analyzed their linearity by taking the ratio between two OD filters.

2024 – 2024 Research Assistant, ***UMD & MIT FCCee Project***

- Worked on the Simulation Tools for Two-Photon Background Electroweak Z Boson Measurements for the Future Circular Collider project at CERN. Advised by Prof. Chris Palmer at UMD and Prof. Christoph Paus at MIT.
- Qualitatively examined the relative performance of various Monte Carlo event generators (including Pythia8, and Whizard 3) for generating the two-photon background in the leptonic and hadronic final states at the FCC-ee and applied cuts to the cross-section from the L3 LEP experiment.
- Presented results at two conferences, of which one won an award for Best Poster.

2022 – 2023 Undergraduate Researcher, ***Joint Center for Quantum Information and Computer Science (QuICS)***

- Investigated the quantum Monte Carlo sign problem with Dr. Jacob Bringewatt (then graduate student in theoretical physics at UMD) and Dr. Dominik Hangleiter, (then postdoctoral fellow at the Joint Center for Quantum Information and Computer Science (QuICS) at UMD).
- Focused on the comprehension of the differences between the Hilbert space mappings without the addition of a constraint such as a gadget (gate).
- Examined the differences of the average sign by developing an algorithm in C++ that generates the Hamiltonians based on the number of clause and variable qubits as well as its connections between physical and computational phase transitions.

2022 – 2022 GRAD-MAP Summer Scholar, ***University of Maryland - Department of Astronomy***

- Worked on Constraints of the Re-inflation of Hot Jupiters orbiting post-main sequence stars. Advised by Prof. Thaddeus Komacek.
- Used MESA (Modules for Experiments in Stellar Astrophysics), a simulation package in FORTRAN that solves the Equation of State, Planetary and Stellar Structures equations and outputs user-defined heating, pressure, and radius profiles.

- Simulated time-evolution, heating profiles, and varying heating efficiency and heating depth to analyze TOI-4329b and observe its consistency and evolution with the current day radius.
- Presented results at the 2022 GRAD-MAP/TREND research conference.

(c) TEACHING EXPERIENCE

2025 - Present Teaching Assistant, ***University of Cincinnati - Department of Physics***
Spring 2026 - College Physics II (PHYS2002)
Fall 2025 - General & College Physics II Labs (PHYS1052L& PHYS2002L)

- Aiding undergraduate students with weekly lab procedures/experiments/problems/clicker-questions based on the lecture portion of the class.
- Explaining fundamental principles of electromagnetism needed to apply to each lab/problem.
- Grading post-lab, quiz submissions, and exams.
- Helping undergraduate students with introductory physics problems.
- Holding office hours for students from my respective assigned labs/lectures.

(d) PRESENTATIONS

1. **Gomes, Othello**; Kowalcyzk, E.; Jiang, E.; Hamilton, P. **(2025, April 16)**. Linearity of photodetectors for Calorimeter's upgrades at LHCb [Poster presentation]. 2025 18th Annual Undergraduate Physics Research Showcase, University of Maryland, College Park, MD, United States.
2. **Gomes, Othello; Anandanatarajan, A.(2024, April 13).** Simulation Tools for Two-Photon Background Electroweak Z Boson Measurements [Poster presentation]. 2024 Conference for Undergraduate Underrepresented Minorities in Physics, Marriott Hotel and Conference Center, College Park, MD, United States. *2024 CU2MiP Best Poster award*
3. **Gomes, Othello; Witt, G.; Anandanatarajan, A.(2024, March 25).** Simulation Tools for Two-Photon Background Electroweak Z Boson Measurements [Poster presentation]. 2nd Annual Future Circular Collider Conference, Massachusetts Institute of Technology, Cambridge, MA, United States.
4. **Gomes, Othello**; Komacek, T. **(2022, August 5)**. Explaining the Re-inflation of a Hot Jupiter [Poster presentation]. 2022 TREND/GRAD-MAP Research Conference, University of Maryland, College Park, MD, United States.

(e) FELLOWSHIPS & AWARDS

2024 **2024 FUTURE of physics** CalTech: Physics, Mathematics, and Astronomy & Heising-Simons Foundation

- Participants accepted into this program go through a two day conference designed to support students applying for or interested in graduate school who identify as gender minorities in physics (women, transgender women, nonbinary, genderqueer, and/or gender non-conforming individuals).

2024 **2024 CU2MiP Best Poster** University of Maryland and National Institute of Standards and Technology

- Awarded to an undergraduate student(s) for presentation of their poster at the Conference for Undergraduate Underrepresented Minorities in Physics. Award is signed by four Nobel Laureates in Physics.

2023 **SQuInT chemistry Fellowship** University of New Mexico - Center for Quantum Information and Control

- Awarded to an undergraduate or graduate student from an underrepresented group that is attending the SQuInT (South West Quantum Information and Technology) conference and/or

majors broadly in disciplines related to Chemistry.

2022 **GRAD-MAP Summer Scholarship** University of Maryland - Department of Astronomy
- Awarded a stipend to eligible GRAD-MAP Winter Workshop alumni to do research with a Physics or Astronomy faculty member at the University of Maryland for the summer.

2022 **Robert and Edna Johnson mathematics Award** Montgomery College
- Awarded to a student who started coursework in developmental math and made their way through higher-level math classes with distinction.

(f) SKILLS

- **Programming Languages**: C, C++, Python, FORTRAN, MATLAB
- **Tools & Libraries**: Numpy, Scipy, Matplotlib, LAPACK, Armadillo, MESA, LaTeX
- **Office Suite**: MS Word, MS Excel, MS Powerpoint.
- **Miscellaneous**: Team Work and Coordination, Leadership, Scientific Communication and Writing.

(g) EXTRACURRICULARS & OUTREACH

1. **2025 - Present** Blogs Team Lead, ***Network for Outreach and Vocation in Astronomy (NOVA)***
2. **2022 - 2022** Social Media Manager, ***Montgomery College - Stargazers Club***
   - Organized social media page(s) for the club.
   - Advertised events around the college and on social media.
   - Set up a mailing list and helping the Secretary with certain task(s).
   - Contributed with ideas pertaining to social outreach for the club.
   - Uploaded images, videos, and any necessary announcements on social media pages.
3. **2021 - 2022** Vice President, ***Montgomery College - Philosophy Club***
   - Organized weekly club meetings, emails, and messages.
   - Worked with the President, Sponsor(Advisor) & Board Members on club goals and resolutions for the academic year.
   - Arranged club events with other respective associations and clubs both affiliated with the college and outside of it.
   - Experimented with different formats of meetings and discussions to help adjust and analyze the social dynamics so that each member's participation can be raised and followed through.
   - Supervised new officers on how to undertake tasks for specific officer roles.

(h) OTHER PROJECTS

2021-2022 Geometry of Quantum States ***GRAD-MAP Winter Workshop 2022***
- Derived equations for the spin states of a particle based on a quantum system (the Stern-Gerlach experiment). Advised by Dr. Jacob Bringewatt (then graduate student).
- Geometrically mapped the spin states from a 2-D(complex)plane to a 3-D plane via Linear Algebra and Python.
- Presented at the end of the 2022 GRAD-MAP Winter Workshop in the form of a power-point presentation.