Katherine Slattery

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EDUCATION

Perimeter Institute for Theoretical Physics — Waterloo, Canada
Physics MSc — 2022-2023

University of Cincinnati — Cincinnati, Ohio
Physics (B.S.), Mathematics (B.A.) — 2021

EXPERIENCE

Graduate Researcher — Nov 2022- June 2023
Perimeter Institute Quantum Intelligence Lab

- Used recurrent neural networks to identify optimal network hyperparameters for reconstructing ground state wavefunctions of Rydberg atom arrays
- Analyzed scaling relations between the number of hidden parameters, network accuracy, and dataset size required to achieve specific accuracy levels. This analysis provided insights into the relationship between network complexity and dataset size in obtaining desired results.

Post-Baccalaureate Researcher, LHCb Experiment — September, 2021 – Aug 2022
CERN Authorized User — Meyrin, Switzerland

- Engaged in data analysis tasks to calculate sources of noise in particle decay tracks to improve signal to noise ratio
- Collaborated with a cross-functional team of researchers to optimize the installation of electronics components for upgrades to the data acquisition system in the upstream tracker subdetector while engaging in troubleshooting and quality assurance tasks
- Consistently communicated progress with colleagues at other institutions through presentations and meetings

Computational Quantum Optics Group — May, 2021 – August 2021
National Institute of Standards and Technology — Gaithersburg, Maryland

- Numerically modelled photon echoes in Praseodymium doped Orthosilicate crystals using a semi-classical approach
- Determined criteria needed for a single photon echo, a necessary condition for applications in quantum memory

Undergraduate Researcher, Theoretical Cosmology Group — April, 2020 – May 2021
University of Cincinnati — Cincinnati, Ohio

- Theoretically modeled gravitationally bound Bose-Einstein condensates dark matter particles using Mathematica to determine the possible signal obtainable through quantum limited force sensing experiments
- Wrote a manuscript describing results which has been submitted for publication

PROJECTS

- "Quantum Causal Inference with DAGs:" investigated equivalence classes of quantum circuits with directed acyclic graphs

PUBLICATIONS

1. Katherine Slattery, Joshua Eby, Lauren Street, Rohana Wijewardhana (2023). "Probing Bosonic Overdensities with Optomechanical Sensing." URL: https://arxiv.org/pdf/2310.06494.pdf
2. Katherine Slattery, Zachary H. Levine (2021). "Simulating Photon Echoes for Quantum Memory." NIST Public Data Repository, Sept. 2021. doi: 10.18434/mds2-2454. URL: `https://data.nist.gov/od/id/mds2-2454`
3. Katherine Slattery (2021). "Probing Axion/Boson Stars with Optomechanical Sensing." The American Physical Society, Jan. 2021. URL: `https://meetings.aps.org/Meeting/CUWIP21/Session/U16.6`

PRESENTATIONS

Quantum Causal Inference

- Perimeter Institute Winter School Conference — February 2023

LHCb

- Status of Pigtail Cable Installation in the Upstream Tracker — November 23, 2021
- Electromechanical Characterization of Dataflex Cables for the Upstream Tracker — August, 2019

- An Analysis of Ξ^{-1} Decay from the LHCb Experiment — July 25, 2017

Conditions for a Single Photon Echo
- NIST Summer Undergraduate Research Fellowship Colloquium (plenary speaker) — August 2, 2021

Probing Boson Stars with Optomechanical Sensing
- Women in Science Experience Talk — November 13, 2020
- University of Cincinnati Undergraduate Student Symposium — August 7, 2020
- Conference for Undergraduate Women in Physics — January 24, 2021
- University of Cincinnati Poster Competition (awarded second place poster) — January 25, 2021
- Capstone Presentation — April 27, 2021

PROFESSIONAL ACTIVITIES
- Peer reviewer for the 2023 International Conference on Learning Representations: "Physics for Machine Learning"

HONORS, SOCIETIES, AND AWARDS
- Perimeter Scholars International Scholarship — September 2022
- WISE Summer Research Fellowship — June, 2020
- Outstanding Junior Award, University of Cincinnati Department of Physics — May, 2020
- Sigma Pi Sigma Physics Honor Society — May, 2020-Present
- Cincinnatus Academic Scholarship — August, 2017-May, 2021

LEADERSHIP AND OUTREACH
Supplemental Instruction Leader — January, 2019 – April 2021

University of Cincinnati Learning Commons
- Independently designed and implemented original lessons to teach hundreds of students enrolled in general physics courses using evidence-based pedagogical techniques
- Regularly communicated with faculty members to discuss teaching practices
- Communicated technical concepts to a diverse audience in a clear and concise manner

Society of Physics Students President — January, 2020 – January, 2021
- Led social and pre-professional activities for a club of over 30 physics students

OTHER SKILLS
Programming: Python, Mathematica,Julia, TensorFlow, Matlab, Jupyter Notebooks
Technology: LaTeX, Excel, PowerPoint, GitHub, Google Colab