

Linnea M. Wolniewicz

Computer Science Ph.D. Student at the University of Hawai‘i at Mānoa and National Science Foundation Fellow

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Education

University of Hawai‘i at Mānoa

Honolulu, HI

Ph.D. in Computer Science

August 2024 - May 2027

M.Sc. in Computer Science, GPA 3.95

August 2022 - July 2024

Fourth year Ph.D. student in Dr. Peter Sadowski’s Applied Machine Learning lab. Selected Coursework: Software Quality Assurance, Human-centered AI, Machine Learning, Deep Learning, AI for Dynamic Systems, Random Processes, Complexity Analysis, AI Seminar

University of Colorado Boulder

Boulder, CO

B.A. in Astrophysics and Minor in Music (Harp performance), GPA 3.86

August 2018 - May 2022

Selected Coursework: **Astrophysics:** Classical Mechanics I, II, Electricity and Magnetism I, II, Quantum Mechanics I, Astrophysics I, II, Black Holes & Relativity

Computer Science: Algorithms, Principles of Programming Languages, Object-Oriented Programming, Data Structures, Scientific Programming I, II, III

Technical Skills

Programming Languages *Proficient:* Python, C++, bash, L^AT_EX. *Working knowledge of:* SQL, Scala, JavaScript, HTML/CSS

Data Science *Proficient:* PyTorch, TensorFlow, HPC, Pandas, Matplotlib, SLURM. *Working knowledge of:* MATLAB, Mathematica

Employment and Research

University of Hawai‘i at Mānoa

Honolulu, HI

Graduate Research Assistant

August 2022 - May 2027, full-time

I research the application of **probabilistic machine learning methods** to scientific data with Dr. Peter Sadowski. I am currently exploring the use of **Gaussian Processes in Python** to perform anomaly detection in stellar time series data with **PyTorch**. I have presented my work on accelerating **simulation-based inference** with **neural likelihood models** at NeurIPS and SPAICE [1], which enables efficient Bayesian inference for the heliospheric transport of galactic cosmic rays.

Frontier Development Lab

Remote

Researcher at HelioLab

June 2025 - October 2025, full-time

My team and I developed a novel dataset and suite of ML models in **PyTorch** to accurately forecast the state of the ionosphere, presented at NeurIPS [2, 3].

Striveworks, Inc

Austin, TX

Data Science Intern

May 2023 - August 2023, full-time

I researched the application of **large language models** to solve natural language tasks, and explored various improvement strategies such as LoRA.

Laboratory for Atmospheric and Space Physics

Boulder, CO

Undergraduate Research Assistant

August 2020 - July 2022, part-time

I implemented K-means and **convolutional neural networks in Python** with **PyTorch** to segment polar coronal holes in images of the Sun [5].

Massachusetts Institute of Technology’s Haystack Observatory

Westford, MA

Research Experience for Undergraduates

May 2021 - August 2021, full-time

I applied a Gaussian mixture model and **convolutional neural networks** to detect ocean wave events in seismic data from Antarctica’s Ross Ice Shelf.

Institute for Astronomy at the University of Hawai‘i at Mānoa

Honolulu, HI

Research Experience for Undergraduates

May 2020 - August 2020, full-time

I analyzed the entire Kepler Space Telescope dataset using **Python** statistical tools such as **Pandas** to evaluate the biases in its selection function [4].

Publications

- [1] **Wolniewicz, L. M.**, Sadowski, P., Corti, C., 2025. “Neural Surrogate HMC: On Using Neural Likelihoods for Hamiltonian Monte Carlo in Simulation-Based Inference” *JGR Machine Learning and Computation*. In Review. [\[Link\]](#)
- [2] **Wolniewicz, L.M.**, Kelebek, H.S., Mestici, S., Vergalla, M.D., Acciarini, G., ... & Soboczenski, F., 2025. “Connecting the Dots: A Machine Learning Ready Dataset for Ionospheric Forecasting Models” [Paper presentation]. Machine Learning for the Physical Sciences. Thirty-ninth Conference on *Neural Information Processing Systems*. [\[Link\]](#)
- [3] Kelebek, H.S., **Wolniewicz, L.M.**, Vergalla, M.D., Mestici, S., Acciarini, G., ... & Baydin, A.G., 2025. “Ioncast: A deep learning framework for forecasting ionospheric dynamics” [Paper presentation]. Machine Learning for the Physical Sciences. Thirty-ninth Conference on *Neural Information Processing Systems*. [\[Link\]](#)
- [4] **Wolniewicz, L. M.**, Berger, T., Huber, D., 2021. “The Stars Kepler Missed: Investigating the Kepler Target Selection Function Using Gaia DR2” *The Astronomical Journal*, Volume 161, Number 5. [\[Link\]](#)
- [5] Tiwari, A.J., Hu, A., Tremblay, B., Smith, B., **Wolniewicz, L.M.**, ... & Samanta, T., 2020. “SEARCH: SEgmentation of polAR Coronal Holes” [Paper presentation]. Machine Learning for the Physical Sciences. Thirty-fourth Conference on *Neural Information Processing Systems*. [\[Link\]](#)

Awards and Honors

Jan. & May 2024 Catalyst Award for Science Advancement (CASA) Grant for Outreach with Graduate Women in Science Hawai‘i

April 2022 National Science Foundation Graduate Fellowship