Leah Hartman

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Education and Training

University of Michigan — Ann Arbor, MI
Doctor of Philosophy in Applied Physics and Scientific Computing — *Fall 2024 – Present*

Western Kentucky University — Bowling Green, KY
Bachelor of Science in Physics, Minor in Mathematics — *Fall 2020 – Spring 2024*

Research Experience

BELLA Simulations — Jan. 2025 - Present
University of Michigan – Supervised by Dr. Alec Thomas — *Ann Arbor, MI*

- Something

Optically-Generated Plasma Lens for Focusing Relativ. Electron Beams — Jun. 2023 – Aug. 2024
University of Colorado, Boulder – Supervised by Dr. Mike Litos — *Boulder, CO*

- Focused on the development of an optical configuration to generate a plasma lens capable of focusing relativistic electron beams in plasma wakefield accelerators
- Created Python code to perform image analysis, including filtering and processing images, to optimize data collection and analysis

Analyzing Rolling Oscillations Along a Cycloidal Ramp — Mar. 2022 – May 2024
Western Kentucky University – Supervised by Dr. Doug Harper and Dr. Ivan Novikov — *Bowling Green, KY*

- Developed an experimental setup to study the translational and rotational motion of objects filled with various viscous liquids along a cycloidal ramp
- Used CAD software to design and construct infrared photogates using IR phototransistors and LEDs. Housed these photogates within 3D-printed enclosures for data acquisition
- Developed Python code for efficient data analysis and additionally finalizing LabVIEW code for the control and operation of the infrared photogates

Demonstration of Stochastic Resonance in a Mechanical Duffing Oscillator — Mar. 2022 – May 2023
Western Kentucky University – Supervised by Dr. Doug Harper and Dr. Ivan Novikov — *Bowling Green, KY*

- Created a system which exhibits stochastic resonance and analyzed its response to different levels of external noise
- Developed Python code for data analysis, using scientific libraries to calculate the Kramers' rate of the system
- Collaborated on troubleshooting and upkeep of the experimental system and LabVIEW code, ensuring smooth operation and data collection

Teaching Experience

Physics Tutor — Aug. 2022 – Dec. 2023

1. The Carol Martin Gatton Academy of Mathematics and Science Physics Tutor (*Aug. 2022 – May 2023*)
   - Courses tutored include: University Physics I, University Physics II
   - Responsibilities include: leading University Physics I and II review sessions, aiding with any homework problems, coding problems, test corrections, general classroom content, and any questions students may have.
2. Western Kentucky University Physics Help Center (*Aug. 2022 – Dec. 2023*)
   - Courses tutored include: University Physics I, University Physics II, Biophysics I, Biophysics II, Modern Physics I, Astronomy of the Solar System, Astronomy of Stellar Systems, Descriptive Astronomy

Learning Assistant — Aug. 2022 – Dec. 2023

- Assisted in teaching introductory physics labs for University Physics I and II
- Responsibilities include: assisting the lab instructor, helping students complete experiments, and ensuring they understand the content each week

Teaching Assistant — Jan. 2023 – Dec. 2023

- Taught introductory physics labs for University Physics I and II
- Responsibilities include: grading weekly lab worksheets and lab reports for each experiment, basic instruction for each experiment, and assisting students in completing lab each week

Conference Presentations and Posters

Hartman, L., Guerrero, M., Doss C., Hansel C., Lee V., Litos M., (May 2024). Optically-generated plasma lens for focusing relativistic electron beams. Poster presented at the International Particle Accelerator Conference, Nashville, TN.

Hartman, L., Guerrero, M., Doss C., Hansel C., Lee V., Litos M., (October 2023). Optically-generated plasma lens for focusing relativistic electron beams. Poster presented at the American Physical Society Division of Plasma Physics conference, Denver, CO.

Guerrero M., **Hartman, L.**, Doss C., Hansel C., Lee V., Litos M., (October 2023). Underdense passive plasma lens for focusing relativistic electron beams. Poster presented at the American Physical Society Division of Plasma Physics conference, Denver, CO.

Hartman, L., Harper D., Hebenstiel L., Novikov I., Sherrard S., (April 2023). An analysis of liquid-filled containers along a curved ramp using the ROL-FC experimental setup. Oral presentation given at the Western Kentucky University Student Scholar Showcase, Bowling Green, KY.

Sherrard, S., **Hartman, L.**, Harper D., Hebenstiel L., Novikov I., (April 2023). Experimental determination of coefficients of friction in rolling oscillation of liquid-filled container (ROL-FC) experimental setup for generation of cycloid. Poster presentation given at the Western Kentucky University Student Scholar Showcase, Bowling Green, KY.

Hartman, L., Harper D., Hebenstiel, L., Novikov I., (November 2022). Experimental setup to study rolling oscillations along a curved ramp. Poster presentation given at the Kentucky Academy of Science annual meeting at Morehead University, Morehead, KY.

Alvarez, I., **Hartman, L.**, Harper D., Hebenstiel, L., Novikov I., (November 2022). Experimental observation of bifurcation in a damped driven oscillator. Poster presentation given at the Kentucky Academy of Science annual meeting at Morehead University, Morehead, KY.

Hartman, L., Harper D., Hebenstiel, L., Novikov I., (November 2022). Experimental study of Kramers' rate in a magnetically-driven duffing oscillator. Poster presentation given at the Southeastern Section of the American Physical Society at the University of Mississippi, Oxford, MS.

Awards, Honors, and Scholarships

Scholar of the Ogden College of Science and Engineering	Spring 2024
George V. Page Award for Excellence in Scholarship in Physics and Astronomy	Spring 2024
Mitchell Scholars Award	Summer 2023
Research Experiences for Undergraduates (REU) Selection	Spring 2023
Henry M. and Zula G. Yarbrough Award in Mathematics	Spring 2023
Hugh F. and Katherine A. Johnson Mathematics Award	Spring 2023
Gatton Academy Cherry Presidential Scholarship	Spring 2022 - Spring 2024
Targeted Gatton and Craft Academy Graduate Scholarship	Spring 2022 - Spring 2024
Faculty-Undergraduate Student Engagement (FUSE) Grant Award	Spring 2022 - Spring 2023

Certifications and Organizations

Sigma Pi Sigma – Physics Honors Society	Spring 2024
Mathematica Student Certification	Spring 2021

Professional Experience

T&N Pools Chemical Technician May 2021 – September 2022

- Tested chemical levels and advised customers on ways to chemically-balance their pools
- Performed routine maintenance, services, and cleaning on customers' pools including balancing chemicals, vacuuming, and installing covers
- Developed a new scheduling system for customer pool services using Python

Skills

Developer Tools: Git (-Lab and -Hub), Slurm, GNU/Linux
Frameworks: OpenCV, PyTorch, NumPy, Pandas
Technical Languages and Codes: Python, C/C++, MATLAB, Mathematica, NI LabVIEW, Java, LaTeX, HiPACE++