Adam Field

Physics Undergraduate — Computational Astrophysics Researcher

Research Profile

Physics undergraduate specializing in computational astrophysics with expertise in neural network-based galaxy shear estimation and large-scale astronomical data processing. Active contributor to open-source astronomical software and physics education content creation.

Education

Worcester Polytechnic Institute, Worcester, MA *Expected May 2027*
B.S. Physics, Minor in Mathematics — GPA: 3.50/4.0 — Dean's List Spring 2025
Advanced Coursework: Graduate-level Classical Mechanics & Mathematical Methods, Differential Geometry

Research Experience

Research Assistant — Northeastern University **June 2025 – Present**

Neural Network Galaxy Shear Estimator (Dr. Sayan Saha)

- Developing JAX-accelerated neural network processing 10,000 galaxy observations per minute
- Implementing deconvolution neural network for metacalibration, drastically improving bias estimation

Independent Research — Worcester Polytechnic Institute **2024 – 2025**

Weak Gravitational Lensing Study (Prof. Källan Berglund)

- Processed astronomical FITS files using SuperBIT lensing pipeline
- Conducted literature review focusing on *Lensing in the Blue II* methodologies

Quantum Games Research — Worcester Polytechnic Institute **July 2025 – Present**

Thermodynamic Strategy Evolution (Dr. Jackson Henry)

- Extended research on community formation, implementing zero-sum game simulations
- Working on alternative characterizations of system entropy, new network topologies, and better visualizations of evolution.

Research Developer — Harvard Black Hole Initiative **June 2024 – Jan 2025**

Gravitational Lensing Visualization (Dr. Dominic Chang)

- Developed real-time black hole lensing algorithms using JavaScript, Three.js, and GLSL
- Created iOS app "Black Hole Vision" for public science education

Lab Assistant — Worcester Polytechnic Institute **2023 – 2024**

Biophysics Laboratory (Prof. Izabela Stroe)

- Analyzed experimental datasets using Igor Pro, developing automated Python visualization reducing analysis time by 50%

Technical Skills & Contributions

Programming: Python, JAX/Flax, JavaScript, Java — **HPC:** GPU Computing, SLURM, Linux
Analysis: Astronomical FITS processing, Machine Learning, Statistical modeling
Open Source: ShearNet ML codebase (MIT license) — **Memberships:** APS, SPS
Outreach: Physics education videos (on YouTube), technical blogs, interactive simulations

Key Projects: Chaotic double pendulum analysis (computer vision tracking, numerical simulations) — Interactive physics education portfolio (portfolio.adamfield.org) — Differential geometry capstone lecture on curvature computation

Teaching & Leadership

Peer Learning Assistant, Worcester Polytechnic Institute 2024 – Present
Eagle Scout Project Leader — Designed & built athletic facilities ($3,000 budget, 15+ volunteers) 2020

Honors & Recognition

Presidential Scholarship, WPI — Gordon Lankton Scholarship, WPI — Excellence in Physics, AAPT

5 Wachusett St, Worcester, MA — 508-223-7000 — adamdfield@outlook.com — github.com/AdamField118