Elliott Walker

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Education

Texas Tech University (**Fall 2022–Present**)
GPA: 3.97
Major in Mathematics (B.S.) with a Minor in Physics
Expected graduation: Spring 2026
Relevant coursework: Galactic Astrophysics (*in progress*), Observational Astronomy, Computational Techniques, Physics I–II & IV (Intro QM), Calculus I–III, Differential Equations I–II, Real Analysis, Abstract Algebra, Geometric Mechanics (*graduate, in progress*), Topology (*graduate*)

Research & Work Experience

Undergraduate Researcher—GLWind REU
Cleveland State University & Texas Tech University
May 2024–Present

- Analyzed meteorological tower data to improve wind profile characterization techniques for wind energy and hazard modeling applications; currently working to use high-frequency data for turbulence characterization
- Programmed and installed weather sensors for urban wind monitoring

Undergraduate Researcher—Mathematical Biology
Texas Tech University
March 2023–Present

- Modeled COVID-19 spatial epidemiological dynamics using PDEs, performing classical stability analysis
- Currently working on numerical solutions and extensions of these and related nonlinear PDE systems

Laboratory Assistant—Observational Astronomy
Texas Tech University
August–December 2024

- Helped students learn to use telescopes and astronomical software for both visual study and optical imaging
- As a previous student of this course, programmed a data analysis pipeline for the study of AGN variability

Cyber Math & Physics Intern
Battelle Memorial Institute (Columbus, OH)
May–August 2025

- Developed Python tools for hardware verification tasks as well as hardware control in optics experiments
- Integrated existing software tools into a unified GUI toolkit to expedite use and development
- Built Raspberry Pi systems and conducted laboratory work, including SEM-EDS, for materials testing

Technical Skills

Programming & Scripting Languages: Python, C++, C#, bash, PowerShell; some MATLAB & R
Python packages: NumPy, SciPy, pandas, Matplotlib, scikit-learn, Astropy, Astroalign
Software & Tools: Git/GitHub, LaTeX, Visual Studio, ArcGIS, Microsoft Excel, AstroImageJ, APT
Operating Systems: Windows, Linux (Debian-based)
Data Analysis: Time series analysis, geospatial data, serial instrumentation control, numerical simulation

Selected Publications

W. Zhang, E. Walker, and C. Markfort, "Influence of Surface Complexity and Atmospheric Stability on Wind Shear and Turbulence …", *Energies*, 18(19), 2025. https://doi.org/10.3390/en18195211.

E. Walker et al., "Improved uniform persistence for partially diffusive models of infectious diseases …", *Math. Biosci. Eng.*, 20(11), 2023. https://doi.org/10.3934/mbe.2023872.

E. Walker et al., "Improved stability analysis on a partially diffusive model of the coronavirus disease of 2019", *Discrete Contin. Dyn. Syst. - B,* 29(12), 2024. https://doi.org/10.3934/dcdsb.2024071.

Seminar and Conference Presentations

E. Walker and K. Yamazaki, "Improved uniform persistence results and PDE models for COVID-19" (Talk). University of Nebraska - Lincoln, Mathematical Biology Seminar, Nov 2023.

E. Walker et al., "Characterization of near-surface wind profiles …". 77th APS Division of Fluid Dynamics Meeting, Nov 2024. Also presented updated work at the UNL Workshop for Fluid Mechanics, May 2025.