MATTHEW WANINK

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EDUCATION

Bachelor of Science: Astronomy and Astrophysics, Computer Science, Interdisciplinary Physics.
University of Michigan – Ann Arbor – Expected 05/2024
Overall GPA: 3.5, Astrophysics GPA: 3.912

- Major Honors in Astronomy (Expected 2024), University Honors 2021, 2022

PROFESSIONAL SUMMARY

Senior at the University of Michigan – Ann Arbor. Extensive experience in various data analysis and visualization tools across most platforms procured through my coursework, programming projects, and research experiences. Particular interest in high energy astrophysics and data analysis for use in studying extreme astronomical phenomena. Additional interest in using computational tools in general to perform all manner of analysis on observational data.

COMPUTATIONAL SKILLS

Python - Extensive experience from research of various data analysis and visualization packages.
C/C++ - Extensive knowledge of the standard. library for use in various programming projects.
LATEX - Extensive knowledge of formatting capabilities for professional papers, assignments, and textbooks.
Zsh/Bash - General command line programming experience as well as script writing for research optimization.
SQL - Extensive script writing experience through database management coursework.
Java - Programming experience through coursework as well as particular experience in use for database management.
JavaScript – Programming experience for both database management and computer security applications.
IRAF - General spectral analysis experience through research and coursework.
HEASoft - Extensive experience with several X-ray analysis tools like Xspec and Xselect through research as well as software building experience.
Windows/Mac/Linux - Extensive experience across all major operating systems through research, coursework, and home use.
Xcode/VS Code - Experience of these major IDEs through programming projects and research.
Jupyter Notebooks/Google Colab - Extensive experience with Python Notebook software through coursework and research.
MATLAB - General programming experience from coursework for use of its modeling and solving tools.
DS9 – Extensive experience in utilizing for data visualization through research and coursework.

RESEARCH HISTORY

RESEARCH ASSISTANT 08/2023 to Present
University of Michigan, Ann Arbor, MI

- Fitting Cluster Sizes and Analyzing Data from the PHANGS Catalog. Research Assistant to Dr. Oleg Gnedin.
- Worked to reformat fitting routines to handle observational image data from the new catalog and fit for the radii of a variety of star clusters observed across different galaxies.
- Expanding upon the work of Dr. Gillen Brown and Dr. Oleg Gnedin which used similar routines for the radii of LEGUS catalog clusters.
- Adapted every step of the existing pipeline from PSF creation to the fitting and creation of the final catalog of galaxy fit information and metadata. Planning to release catalog and paper with analysis upon completion.

RESEARCHER (ASTRO 461 COURSE PROJECT) 05/2023 to 06/2023
University of Michigan, Kitt Peak National Observatory, AZ

- Investigating the Reliability of Photometric Redshifts. Co-investigated with Ryan Walker.
- Month long course project at Kitt Peak to get full investigation process experience. Project proposed, fully investigated, and presented by me and my partner.
- Wrote a telescope proposal paper and collected photometric and spectroscopic data using the McGraw-Hill 1.3 m and Hiltner 2.4 m telescopes at MDM Observatory.
- Learned to operate large-scale telescopes and reduce raw data of multiple different forms.

RESEARCH ASSISTANT 01/2023 to 04/2023
University of Michigan, Ann Arbor, MI

- X-ray data analysis seminar. Worked with Dr. McKinley Brumback.
- Analyzed and fit the X-ray spectrum of NGC 5907 ULX-1 to find its flux and luminosity. Published first author Astronomer's Telegram to showcase findings (ATel #16015).
- Focused on general X-ray spectral fitting process of ultra-luminous X-ray sources as well as black holes and neutron stars.
- Focused on learning and utilizing HEASoft for data analysis as well as various Python computational tools and packages.

RESEARCH ASSISTANT 09/2020 to 05/2021
University of Michigan, Ann Arbor, MI

- Transient and Variable Sources in the Chandra and Gaia Catalogs – Undergraduate Research Opportunity Program – Worked with Dr. Mark Reynolds.
- Worked on cross-matching sources between both catalogs to search for X-ray binaries.
- Focused on learning the various Python data analysis and plotting tools through this introduction to research.

PUBLICATIONS

- **Investigating Swift Observations of NGC 5907 ULX-1 and Estimating its Luminosity – ATel #16015;**
  Wanink, M., Brumback, M., Gaishin A., Kesler E., Morrow, N.
- **Decreasing Flux of LS V +44 17 from 25 March 2023 through 3 April 2023 – ATel #16014;**
  Gaishin, A., Brumback, M., Kesler, E., Morrow, N., **Wanink, M.**
- **Swift Observations of MAXI J1810-222 – ATel #16016;**
  Morrow, N., Brumback, M., Gaishin, A., Kesler, E., **Wanink, M.**
- **Swift Observations of the Transient Magnetar XTE J1810-197 – ATel #16017;**
  Kesler, E., Brumback, M., Gaishin, A., Morrow, N., **Wanink, M.**

PRESENTATIONS

Investigating the Reliability of Photometric Redshifts – Astro 461 Course Project

- Kitt Peak National Observatory Poster Symposium – June 2023 – Poster and Oral Presentation – Co-Presented with Ryan Walker

Transient and Variable Sources in the Chandra and Gaia Catalogs

- University of Michigan Undergraduate Research Opportunity Program Research Symposium – May 2021 – Oral Presentation
- University of Michigan Department of Astronomy Undergraduate Research Poster Session – April 2021 – Poster Presentation

TELESCOPE TIME

MDM Observatory – May 2023 – Astro 461 Course Project – Matthew Wanink and Ryan Walker – Investigating the Reliability of Photometric Redshifts

- **McGraw-Hill 1.3m,** 4.75 hrs
  - Operated and maintained the McGraw-Hill telescope.
- **Hiltner 2.4m,** 3.25 hrs
  - Operated and maintained the Hiltner telescope and spectroscopic instrument.

OTHER WORK

University of Michigan Museum of Natural History – Planetarium Presenter - 09/2022 – Present
University of Michigan Angell Hall Observatory 0.4 m Telescope Operator – 08/2023 – Present
LATEX Formatting Specialist – 06/2023 – 09/2023

- Formatting for publish of the textbook *Fluid Mechanics* (7 ed., in prep) alongside Dr. David Dowling and Dr. Jesse Capecelatro.

Longway Planetarium – Planetarium Presenter – 05/2022 – 09/2022