Yanbo Pan

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Education

University of Michigan | Ann Arbor, MI August/2022 – May/2025
Bachelor of Science: Astronomy & Astrophysics (Honors), Interdisciplinary Physics, Statistics
James B. Angell Scholar: GPA 4.0/4.0
Courses Highlights: *Galaxies, Stars, Exoplanets, Computational Astrophysics, Modern Astronomical Techniques, Methods in Theoretical Physics, Theoretical Statistics, Applied Regression, Computational Methods for Data Science*
Involvements: Mrover, Student Astronomical Society, MUgSS, Transfer Connections

University of Wisconsin-Madison | Madison, WI September/2021 – May/2022
Dean's List: GPA 4.0/4.0
Involvements: Greenhouse Learning Community, Greater University Tutoring Drop-in, Badger Acts of Kindness

Research

Research Interests:
Local group ultra-faint dwarf (UFD) galaxies search and characterization
Alternative evolution pathways for binary stars by orbit modeling
Hot Jupiter atmospheric characterization and retrieval
Bayesian statistics applications on Astrophysics

Undergraduate Research, Astronomy Department | University of Michigan, MI January/2024 – Present
Research Assistant (Advisor: Ryan J. MacDonald)
- Analyze the multidimensional atmosphere of a Hot Jupiter, WASP-52b, with JWST Cycle 2 data
- Measure the chemical composition, temperature, and cloud properties on each side of the planet
- Assess the effect of stellar features on the planet's transmission spectrum

Undergraduate Research, Astronomy Department | Yale University, CT May/2024 – August/2024
Dorrit Hoffleit Scholar (Advisor: Marla Geha)
- Characterize two ultra-faint dwarf galaxies using Keck DEIMOS spectroscopy data
- Calculate ultra-faint dwarf galaxies' dynamical masses based on selected member stars
- Present research results at the Yale Summer Research Symposium

Undergraduate Research, Astronomy Department | UW-Madison, WI June/2023 – June/2024
Research Assistant (Advisor: Robert D. Mathieu)
- Simulate binary stars' orbit to analyze stellar populations within the WIYN open cluster survey
- Design and test MCMC algorithms to modal stellar orbits, reducing observing demands for the Apogee project
- Present research iPoster at the 244th AAS conference

Undergraduate Research, Astronomy Department | University of Michigan, MI January/2023 – May/2024
Research Assistant (Advisor: Eric F. Bell)
- Detect ultra-dwarf satellite galaxies of M31 to understand dark matter distribution in the local group
- Code cluster detecting algorithms to verify the existence of known ultra-dwarf galaxies using Python packages
- Present research findings at the Astronomy department's annual undergraduate poster fair

Talks, Posters & Presentations

2025

AAS 245 (Jan)

Explore the Chemical Recipes of Hot Jupiter Behind the Shade of Spotty Starlight

2024

Yale Summer Research Symposium (July)

Riding Two Dark Horses: A Spectroscopic Study of Ultra-faint Milky Way Satellites

ERES IX (July)

The Effect of Stellar Features on Atmospheric Retrievals of WASP-52b's Transmission Spectrum

AAS 244 (June)

Modelling Binary Orbits in the WIYN Open Cluster Survey - The alternative evolutionary tracks for binary stars.

University of Michigan Undergraduate Research Fair (Apr)

Mining Ultra-Faint Galaxies in the Local Group: Are Missing Satellites All Found?

2023

University of Michigan Physics 391 Research Talk (Oct)

The Missing Satellite Problem

University of Michigan Student Astronomical Society Research Talk (Sep)

Modelling Binary Orbits in the WIYN Open Cluster Survey - The alternative evolutionary tracks for binary stars.

University of Michigan Undergraduate Research Fair (Apr)

Uncovering Ultra-Faint Galaxies in the Local Group

Relevant Experience

Mrover | University of Michigan, MI — September/2022 – May/2023

Member of the Astrobiology Team

- Develop 5 quantitative chemical tests to analyze soil and rock samples for signs of extinct and extant life
- Collaborate with the Instrumentation & Sample Handling team to make chemical tests work in real-time onboard rover for the annual University Rover Challenge

The L.R. Ingersoll Physics Museum | UW-Madison, WI — September/2021 – April/2022

Museum Docent

- Build detailed knowledge of Physics and locations to thoroughly answer guest questions
- Clarify demonstrations, point out overlooked features, and offer further details about special exhibits
- Conduct lab-escape with UIUC and held open-house events during the Wisconsin Science Festival

The Jingrui Academy of Science | Ningbo, China — June/2021 – August/2022

Part-time Tutor

- Craft study materials, handouts, and quizzes by surveying students' perceptions of past exams
- Tutor one-on-one and group tutoring instruction for over 20 students focusing on academic skills
- Advise IB students in grades 10 through 12, helping to develop math, physics, and economic knowledge

Honors & Awards

Dorrit Hoffleit Undergraduate Research Scholarship, Yale University	2024
ERES IX Conference Travel Funds, Cornell University	2024
James B. Angell Scholar, University of Michigan	2024
University Honors, University of Michigan	2022-2024
Dean's List, University of Wisconsin	2021-2022

Outreach

Undergraduate mentor of the Student Astronomical Society (SAS) UFD interest group
Guest writer of the Astrobites Undergraduate Research Series
Volunteer tutor @ the Greater University Tutoring Service (GUTS)
Community Speaker of the Chinese New Year Show @ the U-M Planetarium and Dome Theater
Active member of Badger Acts of Kindness
Scientific blogger @ zhihu.com
Travel agent summer intern @ China CYTS Tours Holding Co., Ltd

Computational Skills

Proficient: Python, R, Markdown, Jupyter
Intermediate: MySQL, Cloud Computing, Unix Shell, LaTex, WSL
Basic: C++, MATLAB, DS9

Datasets:	DECam Local Volume Exploration Survey (DELVE) WIYN Open Cluster Survey (WOCS) JWST Transmission Spectra (NIRISS & NIRSpec) Keck DEIMOS Spectra
Packages:	pandas, numpy, matplotlib, seaborn, scikit-learn, scipy, sqlite3, emcee, pymultinest, pymc3 theJoker, POSEIDON, ezpadova, gala, fitsio, astropy, astroquery

Miscellaneous

Languages: Mandarin Chinese > English > Wu Chinese > Japanese = German (by fluency)
Hobby: Distance Running, Swimming, Hiking, Table Tennis, Snow Watching, Elephant Chess