Yanbo Pan

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Research Interests

Observational Near-Field Cosmology; Dwarf Galaxies; Stellar Dynamics; Stellar Populations; Large Sky Surveys; Computational and Machine Learning Applications in Astrophysics, Astrostatistics

Education

- **University of Virginia** — *2025 – 2030 (Expected)*
  PhD in Astronomy — Charlottesville, VA
- **University of Michigan** — *2022-2025*
  Bachelor of Science: Astronomy & Astrophysics (with High Honors), Statistics, Interdisciplinary Physics — Ann Arbor, MI
  - GPA: 3.99/4.00 (High Distinction)
- **University of Wisconsin** — *2021-2022*
  Physics & Astronomy — Madison, WI
  - GPA: 4.00/4.00

Honors & Awards

1. Provost's Fellowship, University of Virginia ($32,500) — 2025–2030
2. Double Hoo Research Award, University of Virginia ($6,000) — 2026
3. University Graduate Fellowship, Penn State University (Declined) — 2025
4. Homer F. Braddock/Nellie H. and Oscar L. Roberts Fellowship, Penn State University (Declined) — 2025
5. Jerome and Isabella Karle Physical Sciences Award, University of Michigan ($2,000) — 2025
6. Outstanding Undergraduate Major Award, Department of Statistics, University of Michigan — 2025
7. Graduation Speaker, Department of Statistics, University of Michigan — 2025
8. Dorrit Hoffleit Undergraduate Research Scholarship, Yale University ($4,600) — 2024
9. ERES IX Conference Travel Award, Cornell University ($500) — 2024
10. James B. Angell Scholar, University of Michigan — 2023–2025
11. University Honors, University of Michigan — 2022–2025
12. Dean's List, University of Wisconsin — 2021–2022

Publications

J=Journal, P=In Prep, T=Thesis

[J.1] Fournier-Tondreau, M., **Pan, Y.**, et al. (2025). **Transmission spectroscopy of WASP-52 b with JWST NIRISS: water and helium atmospheric absorption, alongside prominent star-spot crossings**. *MNRAS*.

[P.1] **Pan, Y.**, et al. (2025). **JWST MEP - A World Under Spotty Starlight: Detection of CO_2 and H_2O in the Hot Saturn WASP-52b with JWST NIRSpec G395H**. (In Prep).

Science Talks

UVa Astronomy Journal Club, Charlottesville, VA — December 2025
JWST MEP - A World Under Spotty Starlight: Atmospheric Forecast for the Hot Jupiter WASP-52b

AAS 245, National Harbor, MD — January 2025
Exploring the Chemical Recipes of a Hot Jupiter Behind the Shade of Spotty Starlight

Yale Summer Research Symposium, New Haven, CT — July 2024
Riding Two Dark Horses: A Spectroscopic Study of Ultra-faint Milky Way Satellites

ERES IX @ Cornell, Ithaca, NY — July 2024
The Effect of Stellar Features on Atmospheric Retrievals of WASP-52b's Transmission Spectrum

Student Astronomical Society Research Talk, Ann Arbor, MI — September 2023
Modelling Binary Orbits in the WIYN Open Cluster Survey - The alternative evolutionary tracks for binary stars

Posters

AAS 244, Madison, WI — June 2024
Modelling Binary Orbits in the WIYN Open Cluster Survey

University of Michigan Undergraduate Research Fair, Ann Arbor, MI — April 2024
Mining Ultra-Faint Galaxies in the Local Group: Are Missing Satellites All Found?

University of Michigan Undergraduate Research Fair, Ann Arbor, MI — April 2023
Uncovering Ultra-Faint Galaxies in the Local Group

Research Experiences

Graduate Research, Astronomy Department | University of Virginia, VA — 2025 – Present

Research Assistant (Advisors: Steve Majewski & Nitya Kallivayalil)

Chemo-dynamical analysis of resolved stellar populations in Sagittarius Dwarf Galaxy using Gaia EDR3

Undergraduate Research, Astronomy Department | University of Michigan, MI — 2024 – Present

Research Assistant (Advisor: Ryan MacDonald)

Multidimensional atmosphere analysis of WASP-52b using JWST Cycle 2 NIRISS & NIRSpec transmission spectra

Undergraduate Research, Astronomy Department | Yale University, CT — 2024 Summer

Dorrit Hoffleit Scholar (Advisor: Marla Geha)

A spectroscopic study of two ultra-faint Milky Way satellites' dynamics using Keck DEIMOS spectroscopy

Undergraduate Research, Astronomy Department | UW-Madison, WI — 2023 – 2024

Research Assistant (Advisor: Robert Mathieu)

Evaluate the potential of theJoker in binary orbit modeling for the WIYN Open Cluster Survey

Undergraduate Research, Astronomy Department | University of Michigan, MI — 2023 – 2024

Research Assistant (Advisor: Eric Bell)

Mining M31 ultra-faint dwarf satellites in the DECam Local Volume Exploration Survey DR2 footprint

Observing Experiences

APO 3.5m/DSSI — 1 night

Student Mentorship

Nikhil Limgala (Binary orbits modeling; UVa) — 2026
James McDowell (Binary orbits modeling; UW-Madison) — 2025

Teaching Experiences

Teaching Assistant, ASTR 3130: Observational Astronomy — Spring 2026
Graded lab reports; led Python and data analysis discussion sessions/labs on observational techniques; held weekly office hours

Outreach Talks

Astronomy on Tap, Charlottesville, VA — January 2026
Hard-to-Find Cosmic Seasoning in Our Galactic Boiling Soup

Graduation Remarks, Department of Statistics, Ann Arbor, MI — May 2025
From Statistical Toolbox to the Expanding Universe

Student Astronomical Society Outreach Talk, Ann Arbor, MI — April 2025
Dwarf Galaxies: Hidden Gems in Our Cosmic Neighborhood

Year of the Dragon Planetarium Talk, Ann Arbor, MI — February 2024
The Great Race - The Origin of the Chinese Zodiac

University of Michigan Physics 391 Talk, Ann Arbor, MI — October 2023
The Missing Satellite Problem

Science Communication & Public Outreach

Scientific blogger AstroPie@RedNote

Active member of Scientist Network for Advancing Policy (SNAP)

Doghouse telescope operator @ UVa McCormick Observatory

Graduate reviewer for ASPIRE program @ UVa

Undergraduate mentor of the U-M Student Astronomical Society (SAS) UFD group

Undergraduate co-representative of the U-M Astronomy Climate committee

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

Travel agent summer intern @ China CYTS Tours Holding Co., Ltd

Astronomy Data Science Skills

- **Proficient:** Python, R, Markdown, Jupyter, LaTeX
- **Intermediate:** SQL, MESA-web, Cloud Computing, Unix Shell, WSL, Version Control
- **Familiar:** C++, HTML/CSS, Docker, MATLAB, DS9
- **Datasets:** DECam Local Volume Exploration Survey (DELVE), ESA - Gaia, WIYN Open Cluster Survey (WOCS), JWST Transmission Spectra (NIRISS & NIRSpec), Keck DEIMOS Spectra
- **Packages:** pandas, numpy, matplotlib, seaborn, scikit-learn, PyTorch, TensorFlow, scipy, sqlite3, emcee, pymultinest, pymc3, theJoker, POSEIDON, ezpadova, gala, fitsio, astropy, astroquery

Professional Experiences

- **Member of the Astrobiology Team** *2022 - 2023*
  Mrover | *University of Michigan, MI* [🌐]
  ◦ Developed chemical tests for life detection and collaborated on implementation for the University Rover Challenge
- **Museum Docent** *2021 - 2022*
  The L.R. Ingersoll Physics Museum | *UW-Madison, WI* [🌐]
  ◦ Facilitated physics demonstrations and conducted educational events during the Wisconsin Science Festival
- **Part-time Tutor** *2021 - 2022*
  The Jingrui Academy of Science | *Ningbo, China*
  ◦ Provided academic tutoring in math, physics, and economics to IB students through customized instruction