Weixuan Pan

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EDUCATION

Guangzhou University, BS in Astronomy — Sept. 2022 – Jun. 2026

- GPA: 3.46/4.0
- Research Interests: Galaxy formation and evolution, Structure Formation, Dark Matter
- Thesis: Influence of Mass Ratio on the Dynamical and Structural Evolution of the Milky Way-Andromeda Merger (in progress)

RESEARCH EXPERIENCES

Modeling the Milky Way-Andromeda Galaxy Merger — Jul. 2025 – Present

Advisor: Dr. Shi Shao, National Astronomical Observatories

- **Multi-Component Galaxy Models:** Specified core parameters of the MW and M31 (e.g., c = 12) and adopted distribution profiles (i.e., Hernquist halo, exponential disk, and Hernquist bulge).
- **IC Generation:** Produced isolated galaxy ICs for the MW and M31 using GALIC, and constructed merger initial conditions with varying mass ratios (1:1–3:1).

Analysis on Numerical Simulation of Large-Scale Structure — Sept. 2024 – Jun. 2025

Advisor: Dr. Qiao Wang, National Astronomical Observatories

- **Power Spectrum Analysis:** Explored how 3 key cosmological parameters ($\Omega_b h^2$, $\Omega_c h^2$ and A_s) affect the matter power spectrum using CAMB.
- **Halo Finding:** Identified 2 million dark matter halos from N-body simulation snapshots ($50\,h^{-1}$ Mpc box size, 30 million particles) using the FoF algorithm.
- **Halo Statistics:** Analyzed mass function, density profile, and two-point correlation function for massive halo samples.

Spectroscopy of one H II region in the external galaxy NGC 0925 — May 2024 – Nov. 2024

Advisor: Dr. Yewei Mao, Guangzhou University

- **Spectroscopic Processing Pipeline:** Reduced raw spectral data using PyRAF, which corrected CCD two-dimensional data, removed cosmic rays, and extracted and calibrated one-dimensional spectra.
- **H II Spectroscopy:** Applied CCM extinction law to correct for Galactic extinction in H II region spectra, identified 10 spectral emission lines (e.g., Hβ, [OIII] λ4959), and measured line fluxes using Gaussian profile fitting.
- **Physical Parameters Measurement:** Determined dust attenuation (0.630 mag) via Balmer Decrement method, calculated star formation rate (0.019 $M_\odot$ yr^{-1}) from Hα luminosity, and derived oxygen abundance (8.293 dex) through strong-line diagnostics.

EXTRA-CURRICULAR ACTIVITIES

Xinglong Observatory Field Program — Nov. 2024

Research Trainee

- Conducted facility tours of observatory telescopes (e.g., LAMOST, 2.16m Telescope), observed operational workflows of telescope technicians, and investigated strategies for observation planning and resource management.

- Operated 85cm telescope to monitor short-term light variation of 5 blue straggler candidates in open cluster COIN-Gaia 11.

Shenzhen International Dark Sky Community Field Program May 2024
Research Trainee

- Executed night-sky brightness monitoring for dark-sky community and mastered sky brightness measurement techniques and analytical methodologies.
- Delivered astronomy education on telescopic observations and fundamental concepts to local residents and tourists, enhancing their appreciation of dark-sky community significance and fostering greater public interest in astronomical development.

Astronomy Dilettantes Association of Guangzhou University 2022 – 2024
Director of Science and Technology Department

- Organized "Sidewalk Astronomy" outreach activities with the club's telescopes to demonstrate telescopic operations to the public and inspire potential astronomy enthusiasts.
- Served as judge for the 18th Guangdong Province Astronomy Olympiad semi-finals, evaluating contestants' telescopic operation skills and observational methodologies.

HONORS & AWARDS

Second-Class Comprehensive Scholarship, Guangzhou University	2025
Outstanding Staff of the Astronomy Dilettantes Association	2024
Third-Class Comprehensive Scholarship, Guangzhou University	2023

SKILLS & LANGUAGES

Programming: Good at Python (astropy, numpy, scipy, pandas, matplotlib, scikit–learn, PyTorch)

Professional codes: Gadget–4, Swift, GALIC, Pynbody, yt, Colossus, Halotools, Pyraf, CIGALE, Bagpipes

Languages: English (IELTS: 6.5), Mandarin (Native), Cantonese (Native)