Curriculum Vitae

Yujie He

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Employment

09/2025—09/2028 **Position:** PhD supervised by Elena M. Rossi and Nicholas C. Stone
Where: Leiden Observatory

Education

09/2023—08/2025 **Degree:** Master of Science in Astronomy and Cosmology
Where: Leiden Observatory and Lorentz Institute, the Netherlands

09/2019—06/2023 **Degree:** Bachelor of Science in Astronomy
Where: Nanjing University, Jiangsu Prov., China

Research

10/2024—07/2025 **Project:** Multifield inflation attractors
Where: Leiden University
Advisor: Prof. Ana Achúcarro
Highlights:
- Investigate the mathematical structures and observational signatures of a new class of multifield inflation solutions.

10/2023—09/2025 **Project:** Tracing the anisotropy of the local Universe using galaxy clusters and the FLAMINGO simulation
Where: Leiden University
Advisor: Dr. Konstantinos Migkas and Prof. Joop Schaye
Highlights:
- Generated and analyzed 1700 lightcones with halo catalogs in the 2.8Gpc^3 run.
- Current progress suggest the observed anisotropy only coincide with ΛCDM on probability of 10^{-5}.

06/2022—08/2024 **Project:** Interstellar turbulence properties over large dynamical range
Where: Columbia University & MIT
Advisor: Prof. Hui Li and Prof. Mark Vogelsberger
Highlights:
- Developed a code suitable to calculate velocity power spectra over unprecedented dynamical range.
- In-depth experience with SPH simulation particles.

01/2022—06/2022 **Project:** Using Wavelet Scattering Transform to Study the Properties of Interstellar Medium
Where: Columbia University & MIT
Advisor: Prof. Hui Li and Prof. Mark Vogelsberger

Highlights:
- Generated synthesis data and performed accurate non-gaussianity inference with wavelet scattering transform.

09/2022—06/2023 **Project:** Black hole lensing effect and the no-hair theorem
Where: Nanjing University
Advisor: Prof. Jianhua He
Highlights:
- Conducted MCMC ringdown analysis on simulated gravitational waves lensed by a black hole. Code still in use by group members.
- Found that a lensed ringdown signal is no longer a superposition of classical quasi-normal modes from perturbation of Kerr spacetime.

Early Projects

10/2021—06/2022 **Project:** Observation of Alfvén Waves in Magnetic Reconnection Current Sheets
Where: Nanjing University
Advisor: Prof. Xin Cheng
Highlights:
– Developed the pipeline to extract the wave shape from solar observations.
– Greatly improved the accuracy and efficiency of wave shape measurement.

10/2020—06/2021 **Project:** Prediction of EUV Radiation from Stellar Flares Based on Multi-band Observations of Solar Flares
Where: Nanjing University
Advisor: Prof. Xin Cheng
Highlights:
– Gathered and preprocessed about 0.5T of data from Solar Dynamics Observatory.
– Adopted and trained a conditional generative adversarial network (cGAN) that can perform high performance cross-bands image generation.

Presentations

10 Oct, 2024, Galaxy Cluster Seminar, Leiden Observatory, "How (an)isotropic is the late universe? Constraints using galaxy clusters in the FLAMINGO simulation."

Scholarships

2022	NJU Talent Training for Basic Science Scholarship (Outstanding)	CNY 10,000	EUR 1,300
2021	Zheng Gang Oversea Study Scholarship	CNY 30,000	EUR 3,900
2020	NJU Talent Training for Basic Science Scholarship (Outstanding)	CNY 10,000	EUR 1,300

Technical experience

– Highly experienced in Python. Numba acceleration; mpi4py parallel computing.
– Familiar with bash scripts.
– Familiar with using Slurm-based HPCs.
– Basic training in C/C++.

See my GitHub for many of my projects.

Besides research projects mentioned above, I also have a few side projects:
– An espanso snippet for fast latex
– An astrophysics notes website