Curriculum Vitae

Yujie He

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Education

2023—2025	**Degree:**	Master of Science in Astronomy and Cosmology
	Where:	Leiden University, the Netherlands
	GPA:	8.83/10.0

2019—2023	**Degree:**	Bachelor of Science in Astronomy
	Where:	Nanjing University, Jiangsu Prov., China
	GPA:	4.50/5.00

Research

2024—current

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.

2023—current

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 analysed 1700 lightcones with halo catalogues in the 2.8Gpc^3 run.
- Current progress suggest the observed anisotropy only coincide with ΛCDM on probability of 10^{-5}.

2022—2024

Project: Interstellar turbulence properties over extensive 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.

2022—2023

Project: Using Wavelet Scattering Transform to Study the Properties of Interstellar Medium
Where: Columbia University & MIT
Advisor: Prof. Hui Li, Prof. Mark Vogelsberger
Highlights:
- Generated synthesis data and performed accurate non-gaussianity inference with wavelet scattering transform.

2022—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

2021—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.

2020—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."

Honors and awards

2022	NJU Talent Training for Basic Science Scholarship (Outstanding)	CNY 10,000	EUR 1,300
2022	Ruli Scholarship	CNY 5,000	EUR 650
2021	Zheng Gang Oversea Study Scholarship	CNY 30,000	EUR 3,900
2021	NJU Talent Training for Basic Science Scholarship (Third-Class)	CNY 4,000	EUR 520
2021	People's Scholarship (Second-class)	CNY 2,000	EUR 260
2020	NJU Talent Training for Basic Science Scholarship (Outstanding)	CNY 10,000	EUR 1,300
2020	The National Astronomical Observatories of China Scholarship	CNY 3,000	EUR 390
2020	People's Scholarship (First-Class)	CNY 3,000	EUR 390

Technical experience

– Highly experienced in Python. NUMBA acceleration; MPI4PY parallelization.
– 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