

XIAOYUAN YANG

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EDUCATION

Wuhan University

Sep 2021 - Jun 2025

Bachelor of Science in *Physics* | GPA:3.63/4.0 87.8/100

Wuhan, China

- **Scholarship&Honor:** Third-class Scholarship (Sept. 2022); Merit Student (Sept. 2022)

RESEARCH EXPERIENCE

Black Hole Shadow Calculation (TDLI Hands-On Project)

Jan.2024

Tsung Dao Lee Institute (TDLI), Shanghai Jiao Tong University

Supervisor: Prof. Yosuke Mizuno

- Utilized the polarized General Relativistic Radiative Transfer (GRRT) simulation code RAPTOR to construct images and movies of M87 black hole and Sgr A*.
- Investigated the properties of black hole shadows under various conditions including changes in mass, inclination, and additional relevant parameters.

Evolution of Protoplanetary Disks

Sep. 2023 – Present

Department of Astronomy and Institute for Advanced Study, Tsinghua University

Supervisor: Prof. Xuening Bai

- Study plasma physics for astrophysics, reproduce Bondi Accretion and Parker Wind using ODE solver, exploring steady, spherical symmetric accretion and expansion and replicate Weber-Davis Wind Solution.
- To establish semi-analytic model for evolution of protoplanetary disks based on Weber-Davis wind solution and global 2D non-ideal magnetohydrodynamic simulations of protoplanetary disks with outer truncation.

Searching for Compact Objects from LAMOST Time-Domain Survey

Jul. 2022 – Present

Department of Astronomy, School of Physics and Technology, Wuhan University

Supervisor: Prof. Wei Wang

- Search for single-lined spectroscopic binary systems with phase-resolved radial velocity measurements and the periodic signals from the radial velocity measurements with the Lomb-Scargle method, fit the radial velocity curve using MCMC and calculate the mass function.

Numerical Simulation of Black Hole Accretion

Aug. 2023 – Nov. 2023

Shanghai Astronomical Observatory, Chinese Academy of Science(CAS)

Supervisor: Prof. Feng Yuan

- Reproduce hydrodynamical non-radiative accretion flows with ZEUS-2D code to investigate the properties of non-radial rotating accretion flows by introducing an anomalous stress tensor to equations of hydrodynamics.
- Carry out a set of two-dimensional (axially symmetric) hydrodynamic numerical experiments by using a simple starting configuration and a set of well-defined boundary conditions.

SEMINAR SERIES

Tsung Dao Lee Institute (TDLI) Astro-Division 2024 Winter Camp

Jan.2024

Tsung Dao Lee Institute (TDLI), Shanghai Jiao Tong University

- Attended lectures and conducted discussion on planet formation, exoplanets searching, laboratory astrophysics, gravitational wave and plasma around black holes.
- Engaged in a hands-on project related to black hole shadow calculation.

Graduate Summer School on Galaxy for China Space Station Telescope (CSST)

Jul. 2023

Chinese Space Station Telescope Peking University Science Center

- Processed the galaxy survey images captured by the Hubble Space Telescope (HST), including data reading, source selection, photometry, generation of catalog and image cutout.
- Initialized the model with Sersic2D and adopted Levenberg-Marquardt algorithm to perform the single-component fitting with Hyper Suprime-Cam (HSC) data.
- Leveraged Photutils package in Astropy to perform the isophotal fitting with SDSS i-band images of Galaxy NGC 628 and MASK file, extracting parameters for estimating the surface brightness distribution of a galaxy.

Astrophysics

Aug. 2022

Cambridge Interdisciplinary Communication Programme

Supervisor: Dr. Matthew Bothwell

- Studied the big bang of universe, expanding universe, submillimeter astronomy, and frontier of astrophysics, encompassing exoplanet, the gravitational universe, cosmic microwave background.
- Delivered a presentation about Five-hundred-meter Aperture Spherical radio Telescope (FAST) from perspectives of design, science goals, and engineering challenges.

SKILLS

Programming Python, C++, Fortran
Packages Astropy, TheJoker, Scipy, lightkurve

MEMBERSHIP

“Qibin” Astronomical Elite Class

Apr. 2023 –Jun. 2025

Jointly Provided by Wuhan University and National Astronomical Observatories, CAS

- Attend seminars, research class, and internship on frontiers of both theoretical and observational astronomy.
- Doing undergraduate research under the guidance of a mentor.