Yahan Pu

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EDUCATION

University of California, Berkeley **Berkeley, CA**
Visiting Student Sep 2025 – Dec 2025
- Relevant Coursework: Astronomy Data Science Laboratory (ASTRON 128), Stellar Physics (ASTRON 160), Planetary Astrophysics (ASTRON C162).

University of Science and Technology Beijing **Beijing, China**
Bachelor of Science in Applied Physics Sept 2022 – Jun 2026 (expected)
- Relevant Coursework: Quantum Mechanics, Atomic Physics, Thermodynamics and Statistical Physics, Electrodynamics, Computer Language C and Programming, Programming Python.

RESEARCH EXPERIENCE

Research on galaxy mergers and baryonic effects in IllustrisTNG Sep 2024 – Present
National Astronomical Observatories, Chinese Academy of Sciences Beijing, China
Advisor: Dr. Lan Wang, Associate Researcher
- Built one-to-one matched merger samples between hydrodynamical and dark-matter-only simulations.
- Identified infall and merger times and defined the collision angle.
- Investigated how including baryonic physics alters infall times, orbital shapes, and collision angles of mergers.
- Post-processed the results to visualize the evolution of galaxies in both simulations, analyzing the differences in galaxy formation between the two.

Research on viscoelastic thermal convection in polymer solutions Oct 2023 – Sep 2024
School of Mathematics and Physics, University of Science and Technology Beijing Beijing, China
Advisor: Prof. Xinhui Si
- Used an OpenFOAM-based solver for viscoelastic thermal convection, performed mesh and timestep convergence studies and diagnostics to distinguish numerical artifacts from physical instabilities.
- Wrote custom post-processing scripts to compute heat fluxes and flow states.
- Analyzed and post-processed simulation results to extract key physical quantities, visualize flow behavior, and validate against theoretical models.
- Contributed debugging, numerical validation, and figure production to a companion study on entangled polymer solutions with embedded elliptical cylinders.

Astronomy Data Science Projects Sep 2025 – Dec 2025
Department of Astronomy, University of California, Berkeley Berkeley, CA
Course-based projects with Gaia, APOGEE, and SDSS survey data
- Analyzed stellar spectra from APOGEE DR17 to build data-driven models predicting Teff, log g, and metallicity.
- Derived Galactic dust extinction maps from Gaia DR3 RR Lyrae period-luminosity relations via MCMC.
- Trained ResNet-18 CNN on 50,000+ SDSS galaxy images for morphology classification and merger detection using PyTorch with data augmentation and learning rate scheduling.

PUBLICATIONS

- Pu, Y., Wang, L., Zeng, G., & Xie, L. (2025). Comparing galaxy merger orbits in hydrodynamical simulation and in dark-matter-only simulation. arXiv preprint arXiv:2511.17060 Submitted to *Research in Astronomy and Astrophysics*.
- Pu, Y., Guo, B., & Si, X. (2025). Natural convection of dilute polymer solution in a differentially heated square cavity with different thermal boundary conditions. Physics of Fluids, 37(9)https://doi.org/10.1063/5.0285857.
- Guo, Y., Guo, B., Pu, Y., & Si, X. (2025). Numerical investigation of viscoelastic thermal convection in entangled polymer solutions: elliptical cylinder effects within a square enclosure. Submitted to *Physics of Fluids*.

EXTRACURRICULAR ACTIVITIES

Student Lecturer in Physics in the School of Mathematics and Physics Sep 2023 – Sep 2024
- Provided one-on-one tutoring for students who made individual appointments.
- Delivered monthly tutoring sessions for physics courses, aligned with the instructor's course schedule.

Skills

Technical Skills: Python(PyTorch, illustris_python, Astropy, astroquery), C/C++, MATLAB, IllustrisTNG, OpenFOAM, LaTeX, Linux (Ubuntu)
Language Skills: English (TOEFL iBT: 102 (R 29, L 26, S 23, W 24)), Chinese (Native)