Yilin Wang (王艺霖)

wylin@stu.pku.edu.cn | Homepage

Education

Peking University, School of Physics Sept. 2022 – June 2026 (expected)
Bachelor of Science in Physics; GPA: 3.79/4.0; TOEFL: 111 *Beijing, China*

Research Experience

Radiative Effect of Dust on the Climate of Early Mars June 2025 – present

- Advisor: Prof. Robin Wordsworth (Harvard University)
- Calculated key radiative parameters for early Mars dust analogs by applying Mie scattering theory, generating look-up tables for radiative transfer models
- Integrated custom Mie scattering outputs into the PCM_LBL 1D radiative-convective model to simulate the climatic impact of dust on early Mars
- Using the theory of reflectance spectroscopy to determine the reflectance spectra of regolith

Cloud-Resolving Simulation of Precipitation in Planetary Atmospheres Mar. 2025 – present

- Advisor: Prof. Jun Yang (Peking University)
- Utilized the System for Atmospheric Modeling (SAM) to conduct cloud-resolving simulations of diverse planetary atmospheres
- Analyzed the influence of varying solar spectra and surface gravity on precipitation patterns and atmospheric dynamics

Stability of Polar Vortices in Planetary Atmospheres June 2024 – present

- Advisor: Prof. Tao Cai (MUST), Prof. Jun Yang
- Analyzed the stability of planetary polar vortices by conducting 3D simulations and linear stability analysis to identify critical conditions leading to vortex splitting
- Exploring the relationship between vortex instability and atmospheric parameters, with plans to extend the analysis to include various boundary conditions and flow fields

Planetary Atmospheric Spectrum Retrieval based on Machine Learning Nov. 2024 – Dec. 2024

- Course project for Numerical Simulation and AI Forecast of Geophysics Fluids
- Engineered a comprehensive synthetic dataset of planetary emission spectra for model training and validation using the pyratbay radiative transfer model
- Designed, trained, and benchmarked six distinct machine learning architectures (including Linear Regression, MLP, CNNs, and Transformer) to comparatively analyze their performance in retrieving atmospheric composition and profiles

Teaching Experience

Fundamentals of Planetary Science 2024 Fall | School of Earth and Space Sciences, Peking University

- Teaching Assistant | Graded weekly assignments, gave problem session.

Selected Courses

Introduction to Atmospheric Physics, Planetary Physics, Fluid Mechanics, Numerical Simulation and AI Forecast of Geophysics Fluids, Synoptic Meteorology, Computational Physics, Equilibrium Statistical Mechanics, Electro dynamics, Quantum Mechanics

Skills

Programming Languages: Python, Fortran, C, MATLAB, NCL, Mathematica, LaTeX
Climate Models: SAM, LMDZ Generic PCM, PCM_LBL

Awards & Honors

Outstanding Student Presentation Award in the 2024 National Conference in Planetary Science

Third Prize in 2024 Lin-Bridge Exoplanet Symposium

May 4th Scholarship of Peking University (Top 3% among 260 students, 2023)

Merit Student Pacesetter of Peking University (2023)

National Second Prize in CUPT (China Undergraduate Physics Tournament, 2023)

Gold Medal in the 38th CPhO Finals (Chinese Physics Olympiad, 2021)

Extracurricular Activities

China Undergraduate Physics Tournament (CUPT) May 2023 – August 2023
Second Prize, as team member *Chengdu, China*

Undergraduate Project Training and Achievement Presentation Oct. 2022 – May 2023
First Place, as team leader *Peking University*