XIMING XU

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EDUCATION

University College London (UCL), United Kingdom Sept. 2023 - Sept. 2024
M.Sc. in Astrophysics (with Distinction)
Grade: 76/100 (GPA: 3.86/4.00)
Related courses: Physics of Exoplanets, Advanced Physical Cosmology, Physics of Stars

Western University (UWO), Canada Sept. 2019 - Jun. 2023
B.Sc. Honours Specialization in Astrophysics
Grade: 84/100 (GPA: 3.70/4.00)
Dean's Honour List: 2019-2020; 2020-2021; 2021-2022; 2022-2023
Related courses: General Astronomy, Advanced Calculus, Planetary Systems

RESEARCH INTERESTS

- Study the atmospheric composition and potential biosignatures of exoplanets ranging from hot Jupiters to terrestrial planets using transit spectroscopy.
- Discover, characterize and analyze the demographics of exoplanets using techniques such as transit and microlensing.

RESEARCH EXPERIENCE

Transit fitting for stellar parameters: Can exoplanet transits improve our understanding of host star properties? Sept. 2023 - Sept. 2024
M.Sc. project under the supervision of Professor Vincent Van Eylen at University College London

- Developed a Python pipeline for transit light curve fitting and stellar modeling to better constrain host star parameters of transiting exoplanets; code available on GitHub.
- Performed transit light curve fitting on 100 TESS exoplanets to constrain planetary parameters and stellar densities.
- Modeled 100 host stars using three models: light curve-based model, spectroscopy-based model, and combined model.
- Demonstrated that the presence of transiting exoplanets provides an additional reliable constraint for stellar modeling, enabling a better understanding of host star properties.

TESS Follow-up Observing Program (TFOP) Sub-group1 Jun. 2022 - Aug. 2022
Research Participant under the guidance of Professor Shude Mao at Tsinghua University

- Conducted follow-up studies of TESS Objects of Interest (TOIs) using observational data from the Las Cumbres Observatory.
- Performed light curve analysis of objects located within 2.5 arcminutes of each TOI using AstroImageJ.
- Identified false positive signals caused by nearby eclipsing binaries and other potential sources.

Temperature Anisotropies in the CMB Map Jun. 2022 - Aug. 2022
Independent research project under the guidance of Professor Shantanu Basu at Western University

- Analyzed observational cosmic microwave background data from WMAP and Planck, and generated angular power spectrum maps for each dataset.

- Calculated the theoretical angular power spectrum based on the Lambda-CDM model and compared it with the observational data.

Foundations of Exoplanetary Astronomy Feb. 2022 - May 2022

Research Group Leader under the guidance of Professor Joshua Winn at Princeton University

- Gained comprehensive knowledge of major exoplanet detection techniques and their theoretical foundations.
- Developed skills in retrieving data from the NASA Exoplanet Archive and conducting Python-based analysis of exoplanet transit light curves from TESS.
- Analyzed light curves of 100 exoplanets discovered via the radial velocity method to determine whether they also exhibit transits.

ACADEMIC TRAINING

Summer School in Statistics for Astronomers (Penn State University) Jun. 2025

Participant in advanced statistical training for astrophysical research

- Acquired a thorough understanding of modern statistical methods in astrophysics, including Bayesian inference approaches such as MCMC and nested sampling.
- Applied supervised machine learning methods, including decision trees and neural networks, to astrophysical case studies using R.

OUTREACH ACTIVTIES

Popular Science Video Series: Exoplanet (YouTube & Bilibili) Dec. 2024 - Present

Astrophysics Science communicator & content creator

- Produced a series of popular science videos on exoplanets, introducing the past, present, and future of human exoplanet exploration, and explaining the major techniques for detecting exoplanets.
- Published videos on YouTube (channel: Simonverse) and Bilibili (a major Chinese media platform), gaining over 100 followers and several thousand views on Bilibili.

Zooniverse Citizen Science Projects Feb. 2020 - Present

Volunteer Researcher

- Contributed to multiple astrophysics research projects, including Planet Hunters NGTS, Galaxy Zoo, and Exoplanet Explorers.
- Completed thousands of classifications to support the identification of exoplanets and the study of galactic structures.

SKILLS/CERTIFICATES

Programming Languages Python, R, SQL

Astrophysics-specific Tools lightkurve, juliet, batman, BASTA

Certificates

- Applied Data Science with Python *(Coursera Specialization Certificate, University of Michigan, in progress)*
- Learn SQL Basics for Data Science *(Coursera Specialization Certificate, UC Davis)*
- Data Analysis with R Programming *(Coursera Course Certificate, Google)*