

Zhuofu (Chester) Li

zhuofu@uw.edu | [Personal Website](#)

[LinkedIn](#) | [Github](#)
Seattle, WA - 98105, USA

EDUCATION

- **Dual Ph.D. in Astrophysics and Astrobiology: Advanced Data Science Track** Sep 2022 - Present
University of Washington, Seattle (UW, Seattle) Seattle, WA, USA
- **Dual M.S. in Astrophysics and Statistics: Machine Learning and Big Data Track** Sep 2022 - Present
University of Washington, Seattle (UW, Seattle) Seattle, WA, USA
- **Dual B.S. in Astrophysics and Geophysics with Departmental Highest Honors** Sep 2018 - Jun 2022
University of California, Los Angeles (UCLA) Los Angeles, CA, USA

EXPERIENCE (SELECTED)

- **Temporary Jovian Co-orbitals: Asteroid Orbit Integration Pipeline** Jan 2025 - Present
University of Washington, Seattle Advisor: Prof. Sarah Greenstreet
 - Built a data pipeline to process orbital parameters for 15k+ asteroids, generating 1,000 statistical clones per object to quantify uncertainties and capture the full distributions of possible trajectories.
 - Ran large-scale N-body simulations for millions of years on high-performance computing clusters to model long-term dynamical evolution of asteroids.
 - Developed classification algorithms to detect and categorize anomalous objects, enabling robust identification of temporary Jovian co-orbitals.
- **Inferring Dark Matter Subhalo Properties Using Simulation-Based Inference** Sep 2024 - Aug 2025
University of Washington, Seattle Advisor: Prof. Nora Shipp
 - Applied Neural Posterior Estimation to infer key parameters (mass, scale radius, 2 velocity components, impact parameter, and orientation angle) of perturbers in complex dynamical systems.
 - Trained transformer-based neural networks with conditional normalizing flows on 150k+ particle-spray simulations, achieving well-calibrated posteriors even in high-dimensional parameter spaces.
 - Performed forecasting analyses across observational scenarios (present-day vs. future survey depths), quantifying uncertainty reduction and identifying optimal trade-offs between sample size, data completeness, and measurement precision.
- **Estimates of Rotation Periods for Jupiter Trojans with ZTF Lightcurves** Sep 2022 - Sep 2024
University of Washington, Seattle Advisor: Prof. Željko Ivezić
 - Processed and cleaned millions of time-series observations from large-scale datasets, implementing statistical filtering and noise-correction pipelines to construct robust training samples.
 - Applied advanced period-finding algorithms and cross-validation against external databases to extract reliable periodic signals, improving estimation accuracy for rare, high-variance cases.
 - Derived empirical constraints from large-scale time-series analysis, identifying stability thresholds (spin barrier at 4–4.8 h) and inferring underlying system properties through distributional modeling.

AWARDS (SELECTED)

- **UCLA - Salutorian of The Department of Earth, Planetary, and Space Sciences** 2022
- **UCLA - Chancellor's Service Award** 2022
- **Caltech - Astronomy Summer Undergraduate Research Fellowship** 2021

SKILLS

- **Programming:** Python (NumPy, Pandas, Scikit-learn, PyTorch, TensorFlow), C++, R, SQL, Java, HTML/CSS
- **Machine Learning:** Deep Learning (CNNs, Transformers), Simulation-Based Inference, Anomaly Detection, NLP, Reinforcement Learning
- **Statistical & Quantitative Methods:** Bayesian Inference, Time-Series Modeling, Stochastic Simulation, Monte Carlo Methods, Optimization, Risk Modeling
- **High-Performance Computing:** Parallel Computing, GPU Acceleration, Workflow Automation, Large-Scale Simulation Management