

# Zhuofu (Chester) Li

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Seattle, WA - 98107, USA

## EDUCATION

- **University of Washington, Seattle (UW, Seattle)** Sep 2022 - Present  
*Dual Ph.D. in Astrophysics and Astrobiology; Dual M.S. in Astrophysics and Statistics* Seattle, WA, USA
  - GPA: 3.9/4.0
- **University of California, Los Angeles (UCLA)** Sep 2018 - Jun 2022  
*Dual B.S. in Astrophysics and Geophysics with Highest Honors* Los Angeles, CA, USA
  - GPA: 3.9/4.0

## PROJECTS

- **Inferring Dark Matter Subhalo Properties Using Simulation-Based Inference** Sep 2024 - Present  
*University of Washington, Seattle*
  - Used Simulation-Based Inference (SBI) to study stellar streams and their interactions with dark matter halos, contributing insights into dark matter's role in the Milky Way's substructure.
  - Utilized normalizing flows and Bayesian methods to forward model stellar stream data and analyze dark matter subhalo interactions.
  - Generated high-resolution simulations of stellar streams under different dark matter halo configurations.
- **LSST Asteroid Streak Detection Using Convolutional Neural Network** Jan 2024 - Present  
*University of Washington, Seattle*
  - Developed a machine learning algorithm to detect faint, fast-moving asteroids in large datasets, enhancing detection sensitivity with a U-Net-based CNN.
  - Managed and processed large datasets using Python, including injecting synthetic sources to create training and testing datasets with known ground truth for model validation.
  - Led simulations and hyperparameter tuning, applying advanced statistical methods to improve detection accuracy.
- **Estimates of Rotation Periods for Jupiter Trojans with ZTF Photometric Light Curves** Sep 2022 - Sep 2024  
*University of Washington, Seattle*
  - Analyzed large time-series datasets using Python and Lomb-Scargle periodogram to estimate rotation periods for 2073 Jupiter Trojans.
  - Applied statistical methods to identify trends and relationships, providing insights into the formation and evolution of these objects.
  - Developed robust methods for analyzing light curves and phase-folded data, resulting in high-confidence period estimates, supported by comparisons with the Asteroid Lightcurve Database.
- **A Systematic Search for Short Orbital Period Cataclysmic Variables Using ZTF** Jan 2021 - Oct 2022  
*California Institute of Technology*
  - Systematically searched for cataclysmic variables (CVs) with short orbital periods using ZTF light curves, identifying 235 objects, including 176 newly discovered CVs.
  - Employed advanced data analysis techniques such as Gaussian Process Regression and Lomb-Scargle periodogram to detect periodic variability in CVs despite challenges from irregular sampling and brightness variability.
  - Classified objects based on light curve shapes, Gaia parallax, and color data from Pan-STARRS and WISE, identifying 50 high-confidence CV candidates, including several period bouncers.

## PATENTS AND PUBLICATIONS

C=CONFERENCE, J=JOURNAL, P=PATENT, S=IN SUBMISSION, T=THESIS

- [J.1] Z. Li, Y. Chowdhury, Ž. Ivezić, et al. **Estimates of Rotation Periods for Jupiter Trojans with ZTF Photometric Light Curves** . Manuscript in preparation.
- [J.2] P. M. Ogle, et al. (including Z. Li). **Radio Jet Feedback on the Inner Disk of Virgo Spiral Galaxy Messier 58.** *Astrophysical Journal*, 962 (2), 196.
- [J.3] J. Roman, et al. (including Z. Li). **A giant thin stellar stream in the Coma Galaxy Cluster.** *Astronomy & Astrophysics*, 679, A157.
- [J.4] J. L. Margot, et al. (including Z. Li). **A Search for Technosignatures Around 11680 Stars with the Green Bank Telescope at 1.15-1.73 GHz.** *Astrophysical Journal*, 166 (5), 206.

## SKILLS

- **Programming Languages:** Python, C++, R, Java, HTML
- **Statistical Analysis:** Time-Series Analysis, Probability, Simulation-Based Inference, Pattern Recognition
- **Machine Learning:** Deep Learning, Natural Language Processing, Supervised/Unsupervised Learning, Reinforcement Learning
- **Data Management:** Large Dataset Handling, Simulation, Backtesting
- **Quantitative Research:** Statistical Modeling, Algorithm Development

## HONORS AND AWARDS

- **UCLA Department of Earth, Planetary, and Space Sciences Salutatorian** 2022  
UCLA
  - Graduated as Salutatorian for outstanding academic performance in the department.
- **UCLA Chancellor's Service Award** 2022  
UCLA
  - Recognized graduating students with a sustained record of outstanding service to UCLA and the Los Angeles community
- **Caltech Astronomy Summer Undergraduate Research Fellowship** 2021  
Caltech
  - Selected for a highly competitive research fellowship in astronomy.

## LEADERSHIP EXPERIENCE

- **President, Chief Telescope Operator, and Astrophotographer** Sep 2018 - Sep 2022  
*The Astronomical Society at UCLA*
  - Led astronomy education initiatives for non-majors, organizing and conducting weekly public telescope viewing sessions.
  - Delivered engaging public lectures on astronomical phenomena and curated a selection of celestial objects for observation.
  - Captured high-quality images of deep-sky objects using a 0.36m Schmidt-Cassegrain Telescope, contributing to the society's astrophotography archive.
- **President** Sep 2020 - Sep 2022  
*The Society of Sigma Gamma Epsilon UCLA (The National Honor Society for the Earth Sciences)*
  - Provided strategic leadership and direction, advancing the organization's mission and goals.
  - Successfully planned and executed field trips, outreach events, and educational displays, enhancing engagement and learning opportunities for members.

## CERTIFICATIONS

- **Stanford University:** Machine Learning Specialization 2024
- **DeepLearning.AI:** Deep Learning Specialization 2024
- **DeepLearning.AI:** TensorFlow Developer Professional Certificate 2024

## ADDITIONAL INFORMATION

**Languages:** English (Native), Mandarin (Native), Japanese (Intermediate)

**Interests:** Quantitative Finance, Machine Learning, Data-Driven Research, Financial Markets, Traveling, Astrophotography