Chris "Le" Wang
Curriculum Vitae

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EDUCATION

Aug. 2021 – May 2025	**Johns Hopkins University**, *Baltimore, MD, USA* BSc in Computer Science, Physics, and Applied Mathematics & Statistics GPA: 3.95/4.00 Minor: Mathematics Grad courses taken: 9

RESEARCH PROJECTS

Jan. 2022 – present

Schlaufman Exoplanet Group

Advisor: Prof. Kevin C. Schlauman, Dr. Matthew S. Clement

- **Unresolved Binary Star Rejection**: Assembled photometry for every star confirmed as an open cluster member by Gaia. Designed algorithms that fit Hertzsprung–Russell diagrams and reject unresolved binary stars.

- **Stellar Elemental Abundance and Planet Formation**: Simulated the mass evolution of stellar surface convective zone using Modules for Experiments in Stellar Astrophysics (MESA). Showed there is no relationship between stellar photospheric elemental abundance pattern and planet formation.

- **Planet Formation with N-body Simulation**:
  - investigate the relative importance between pebble accretion and planetesimal accretion to the outcomes of planet formation directly with numerical simulations and exoplanet demographics with Mercury6.
  - investigate the stability of mean-motion-resonance chains for TOI-700 system with Mercury6.
  - investigate the planet formation outcomes for MK-dwarf systems with varying disk mass, which is then combined with a volatile growth model to track planets' atmospheric and mantle composition of H_2O, N_2, and CO_2.

May 2022 – Present

Sing Exoplanet Group

Advisors: Prof. David K. Sing, Zafar Rustamkulov

- **JWST data reduction pipeline development**: Optimized JWST NIRSpec data reduction pipeline using nested sampling to extract transit light curves; reduced the light curve extraction runtime by an order of magnitude. Integrated the capability to reduce JWST NIRISS/SOSS data to the team's JWST data reduction pipeline originally designed for NIRSpec.

- **Transmission Spectroscopy**: Extracted transmission spectra for WASP-96b, HAT-P-14b, and K2-18b. Combined transmission spectrum from SOSS with that derived from various space-based and ground-based observatories and retrieved atmospheric properties.

Apr. 2020 – Nov. 2020	**Polar Research Institute of China (PRIC)**
	Advisor: Dr. Peng Jiang

- **General Relativity Testing**: coauthored a paper (three authors contributed equally) on the possibility to detect general relativity in exoplanet systems. Derived an analytic formula evaluating the sensitivity of perihelion's precession in radial velocity measurements. Explored the possibility to detect general relativistic precession in exoplanets through radial velocity measurements using RadVel.

Jan 2020 – May 2020	**Duke University**
	Advisor: Prof. Thomas C. Mehen

- **Quantum Computing**: coauthored a paper on testing Bell's and Mermin's inequalities on quantum computers. Designed two-Qbit and three-Qbit quantum circuits and analyzed simulation results.

Awards & fellowships

2024	**IDIES Summer Student Fellowship**
	\$6,000, JHU, competitive research fellowship awarded to 5 undergraduates conducting data-intensive research.
2024	**ΣΠΣ Physics Honor Society**
	Awarded for outstanding academic achievement in physics and astronomy.
2023	**Summer Provost's Undergraduate Research Award**
	\$6,000, JHU, competitive research fellowship (36 out of 400+ applicants).
2023	**Dean's ASPIRE Grants**
	\$2,474, JHU, competitive research fellowship; awarded to 10 undergraduates per year.
2022	**Hophacks 2nd place**
	Hopkins's premier 36-hour hackathon. 2/40. \$512 prize.
2022	**Quest2Learn Most Innovative Platform to Help with Learning**
	Awarded for creating an application that helps with learning.
2022	**Bloomberg Distinguished Professor Fellowship**
	\$6,000, JHU, competitive research fellowship; awarded to 2 physics undergraduates.
2021–present	**Dean's List**
	Excellence in academics. Awarded every semester (6/6).

Publications

5. **Wang, C. L.**, Sing, D. K., & Rustamkulov, Z., "Transmission Spectroscopy of WASP-96b with Combined VLT, Hubble, and NIRISS/SOSS Retrieval" *in prep.*

4. Liu, R.*, **Wang, C. L.***, Rustamkulov, Z., & Sing, D. K., "Rereduction and Calibration of JWST NIRSpec and NIRISS Commissioning Data on Hat-p-14b with the Latest Methods" *in prep.* (*: Co-first author)

3. **Wang, C. L.** & Schlaufman, K. C., "Elemental Abundance Trends with Condensation Temperature are Unrelated to Planet Formation" *in prep.*

2. Gou, X.*, Pan, X.*, **Wang, C. L.***, "General Relativity Testing in Exoplanetary Systems " *IOP Conf. Ser.: Earth Environ. Sci.* (2021). (*: Equal contributions).

1. Zheng, Y., Wang, X., **Wang, C. L.** et al., "Test of Bell's and Mermin's inequalities on Quantum Computer" *2020 2nd International Conference on Information Technology and Computer Application* (2020).

Talks & Presentations

APRIL 2024	**FIREFLy-SOSS: Exoplanet Transit Light Curves Extraction Pipeline for JWST NIRISS-SOSS Observations** *Departmental Undergraduate Research Showcase, Johns Hopkins University, MD*
APRIL 2024	**Is The Formation Of Planets The Cause of Solar Atypical Abundance Pattern?** *Johns Hopkins University DREAMS Symposium*
APRIL 2024	**Characterization of Cloud-free Hot-Saturn WASP-96b with Joint JWST, Hubble, VLT, and Spitzer Transmission Spectroscopy** *Johns Hopkins University DREAMS Symposium*
JAN 2024	**Elemental Abundance Trends with Condensation Temperature are Unrelated to Planet Formation** *243rd Meeting of the American Astronomical Society, New Orleans, LA*
JUNE 2023	**Elemental Abundance Trends with Condensation Temperature are Unrelated to Planet Formation** *Origins of Solar Systems Gordon Research Conference, Mount Holyoke College, MA*
JUNE 2023	**Stellar Elemental Abundance Patterns: Implications for Planet Formation** *No-PhD Journal Club, Johns Hopkins University, MD*
AUG. 2022	**Optimizing JWST BOTS Transit Light Curve Fitting** *The Center for Astrophysics Research Experience, Johns Hopkins University, MD*

Telescope Allocations

2024 Q3	**Apache Point Observatory, ARCTIC, 3 nights** *Synergistic Cool Star Monitoring: Characterization of Starspots* PIs: Rustamkulov, Z., Allen, N., **Wang, C. L.**, Wang, G.

Teaching appointments

2024 SPRING	Teaching Assistant, AS.171.108 General Physics II (Undergraduate, 23 students)
2023 FALL	Teaching Assistant, AS.171.107 General Physics I (Undergraduate, 46 students)
2023 SPRING	Teaching Assistant, AS.171.101 General Physics I (Undergraduate, 46 students)
2022 FALL	Teaching Assistant, AS.171.101 General Physics I (Undergraduate, 23 students)

Skills

COMPUTER SLANGS	Python, C/C++, Java, Assembly, Fortran, Matlab, R, HTML, CSS, JavaScript, Bash
LANGUAGES	English, Chinese, French
ASTRONOMY SOFTWARES	DS9, Siril, MESA (stellar structure), Rebound (N-body), Mercury (N-body), petitRADTRANS (atmospheric retrieval)
OBSERVATION EXPERIENCE	The Morris W. Offit Telescope (half-meter telescope at JHU), ARC 3.5m telescope at Apache Point Observatory
OTHER	Pytorch, LaTeX, Git, Slurm, Mathematica, JupyterLab, Adobe Lightroom, Adobe Photoshop, Blender, Soccer, A Cappella, Marathon