

Gavin Wang

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Education

Johns Hopkins University, Baltimore, MD, USA
Bachelor of Science in Physics, GPA 3.90 / 4.00

August 2022 – May 2026 (expected)

Research Experience

Summer Undergraduate Research Fellow, California Institute of Technology

June 2024 – present

Mentors: Jerry Xuan, Prof. Dimitri Mawet

- Analyzed high-resolution spectra from the Keck Planet Imager and Characterizer of a low mass L dwarf
- Used radiative transfer models and high-performance computing to measure atmospheric abundances
- First-author paper in preparation

James Webb Space Telescope Research Intern, Space Telescope Science Institute October 2023 – present

Mentor: Dr. Néstor Espinoza

- Using Bayesian statistics and wavelet analysis to reduce 1/f noise for JWST's Near-Infrared Spectrograph
- Tests on synthetic data show 15% reduction in noise compared to existing algorithms
- Developed C and Python code for [whitening 1/f noise](#)

Research Intern, Johns Hopkins University

April 2023 – April 2025

Mentors: William Balmer, Prof. David Sing

- Used WIYN/NEID radial velocity data and Transiting Exoplanet Survey Satellite (TESS) photometry to measure the density of HAT-P-67 b
- Found HAT-P-67 b to be the largest and second lowest-density hot planet known to date
- First-author paper accepted to *The Astronomical Journal*

Undergraduate Researcher, Space Telescope Science Institute

January 2022 – December 2023

Mentor: Dr. Néstor Espinoza

- Searched for transit depth variability among a sample of 330 exoplanets using TESS data
- Used transit photometry fitting, periodogram analysis, and parallel processing
- [First-author paper](#) published in *The Astronomical Journal*

Junior Member, TESS Follow-up Observing Program

July 2020 – January 2022

Mentor: Dr. Karen Collins

- Helped identify 12 extrasolar planets from 100+ datasets collected by the Las Cumbres Observatory
- 24 co-author publications (2021 – 2024)

Select Coursework

Physics: Classical Mechanics I/II, Special Relativity & Waves, Quantum Mechanics I/II, Statistical Physics

Astronomy: Physical Cosmology, Observational Astronomy, Radiative Astrophysics

Math: Honors Algebra I, Probability, Real Analysis I

Honors & Awards

Barry M. Goldwater Scholarship , Goldwater Foundation <i>Supports students who show exceptional promise of becoming the Nation's next generation of research leaders</i>	March 2025
Carnegie Astrophysics Summer Student Internship , Carnegie Observatories <i>\$7,000 award for conducting a ten-week summer research project</i>	February 2025
Maryland Sellinger Scholarship , JHU <i>Donor-funded scholarship recipient</i>	December 2024
ΣΠΣ , JHU Chapter <i>Inducted into honor society in recognition of outstanding scholarship in physics and astronomy</i>	May 2024
Summer Undergraduate Research Fellowship , Caltech <i>\$7,740 award for conducting a ten-week summer research project</i>	April 2024
Dean's List , JHU	Spring 2023 – present
Provost's Undergraduate Research Award , JHU <i>\$3,000 award; one of 25 selected research proposals out of 137</i>	October 2022

Successful Proposals

Co-Investigator , “Direct Detection and Characterization of a Nearby Temperate Giant Planet” Awarded 47.3 hours for JWST Cycle 4 (GO 6915)	2025
Principal Investigator , “Unlocking the periods and masses of two young long-period planets” Awarded 23 hours on Miniature Exoplanet Radial Velocity Array-Australis	2025
Co-Investigator , “Synergistic Cool Star Monitoring” Awarded 14.5 hours on Apache Point Observatory ARC 3.5-meter Telescope	2024

Posters/Talks

TESS Science Conference III (<i>poster</i>) “A Blind Search for Transit Depth Variability with TESS”	August 2024
JHU Undergraduate Research Showcase (<i>poster</i>) “A Blind Search for Transit Depth Variability with TESS”	April 2024
TESS Science Talks @ MIT (<i>invited talk</i>) “Searching for Transit Depth Variability with TESS”	March 2024
JHU DREAMS Conference (<i>poster</i>) “A Blind Search for Transit Depth Variability with TESS”	October 2023
54th Annual Meeting of the AAS Division for Planetary Sciences (<i>poster</i>) “Constraints on Transit Depth Variations of Known Exoplanets with TESS”	October 2022
53rd Annual Meeting of the AAS Division for Planetary Sciences (<i>poster</i>) “Developing a Tool to Automate the Search for NEBs Among TOIs”	October 2021
TESS Science Conference II (<i>poster</i>) “Analyzing FFIs to Identify False Positives within TESS Candidates”	August 2021
Society for Astronomical Sciences 2021 Symposium on Telescope Science (<i>poster</i>) “Eclipsing Binaries Identified Through the TESS Follow-up Observing Program”	June 2021

Teaching & Outreach

Learning Den Tutor, JHU

Fall 2023

- Personalized tutoring for General Physics I

Undergraduate Learning Assistant, JHU

Spring 2023 – Fall 2023

- Assisted for General Physics I (AS.171.101 and AS.171.107) weekly discussion sections
- Held weekly 2-hour office hours

Hopkins Insider Contributor, JHU

May 2023

- Wrote [blog post](#) on my exoplanet research for prospective undergraduates

Refereed Publications

First-author publications:

1. **Wang**, Balmer, Pueyo et al., “A Revised Density Estimate for the Largest Known Exoplanet, HAT-P-67 b,” Accepted to *The Astronomical Journal*.
2. **Wang**, Espinoza, “A Blind Search for Transit Depth Variability with TESS,” *The Astronomical Journal* (2024), 167, 1.

Select co-authored publications: see [Google Scholar](#) for full list; 24 publications and 401 citations

1. Peterson, Benneke, Collins et al. (including **Wang**), *A temperate Earth-sized planet with tidal heating transiting an M6 star*, *Nature* (2023), 617, 701.
2. Persson, Georgieva, Gandolfi et al. (including **Wang**), *TOI-2196 b: Rare planet in the hot Neptune desert transiting a G-type star*, *Astronomy & Astrophysics* (2022), 666, A184.
3. Sha, Vanderburg, Huang et al. (including **Wang**), *TESS spots a mini-neptune interior to a hot saturn in the TOI-2000 system*, preprint, arXiv:2209.14396.
4. Caciapuoti, Inno, Covone et al. (including **Wang**), *TESS discovery of a super-Earth and two sub-Neptunes orbiting the bright, nearby, Sun-like star HD 22946*, preprint, arXiv:2209.09597.
5. Chontos, Murphy, MacDougall et al. (including **Wang**), *The TESS-Keck Survey: Science Goals and Target Selection*, *The Astronomical Journal* (2022), 163, 297.
6. Christian, Vanderburg, Becker et al. (including **Wang**), *A Possible Alignment Between the Orbits of Planetary Systems and their Visual Binary Companions*, *The Astronomical Journal* (2022), 163, 207.
7. Winters, Cloutier, Medina et al. (including **Wang**), *A Second Planet Transiting LTT 1445A and a Determination of the Masses of Both Worlds*, *The Astronomical Journal* (2022), 163, 168.
8. Kaye, Vissapragada, Günther et al. (including **Wang**), *Transit timings variations in the three-planet system: TOI-270*, *Monthly Notices of the Royal Astronomical Society* (2022), 510, 5464.
9. Grunblatt, Saunders, Sun et al. (including **Wang**), *TESS Giants Transiting Giants. II. The Hottest Jupiters Orbiting Evolved Stars*, *The Astronomical Journal* (2022), 163, 120.
10. Giacalone, Dressing, Hedges et al. (including **Wang**), *Validation of 13 Hot and Potentially Terrestrial TESS Planets*, *The Astronomical Journal* (2022), 163, 99.
11. Scarsdale, Murphy, Batalha et al. (including **Wang**), *TESS-Keck Survey. V. Twin Sub-Neptunes Transiting the Nearby G Star HD 63935*, *The Astronomical Journal* (2021), 162, 215.
12. Gan, Bedell, Wang et al. (including **Wang**), *HD 183579b: a warm sub-Neptune transiting a solar twin detected by TESS*, *Monthly Notices of the Royal Astronomical Society* (2021), 507, 2220.
13. Otegi, Bouchy, Helled et al. (including **Wang**), *TESS and HARPS reveal two sub-Neptunes around TOI 1062*, *Astronomy & Astrophysics* (2021), 653, A105.

14. Dong, Huang, Dawson et al. (including **Wang**), *Warm Jupiters in TESS Full-frame Images: A Catalog and Observed Eccentricity Distribution for Year 1*, The Astrophysical Journal Supplement Series (2021), 255, 6.
15. Rodriguez, Quinn, Zhou et al. (including **Wang**), *TESS Delivers Five New Hot Giant Planets Orbiting Bright Stars from the Full Frame Images*, The Astronomical Journal (2021), 161, 194.

Skills

- Languages: English (native), Chinese (native)
- Computing: Python (5+ years), C/C++, Linux, HPC
- Software: AstroImageJ, Astropy, Anaconda, Matplotlib, NumPy, SciPy, dynesty, corner, emcee, Ray
- Astronomy: 80 hours experience operating 0.5m Morris W. Offit Telescope