

# Xian-Yu Wang

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PhD in Astrophysics

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## CURRENT POSITION

Indiana University

Feb. 2023 - Present

Sullivan Prize Postdoctoral Fellow

## EDUCATION

University of Chinese Academy of Sciences (UCAS)

Beijing, China

National Astronomical Observatories, Chinese Academy of Sciences (NAOC)

Ph.D in Astrophysics

Jan. 2023

Thesis: *Study of exoplanets based on high-precision  
photometric and spectroscopic observations*

Advisor: Zhen-Yu Wu

Shandong University

Weihai, Shandong, China

B.S in Space Science and Technology

Jun. 2018

## RESEARCH INTERESTS

My research focuses on the architectures and dynamical evolution of exoplanetary systems, leveraging dynamical imprints such as stellar obliquity and orbital eccentricity, together with unified physical modeling and large-scale, data-driven statistical analyses, to uncover their formation and migration histories.

## AWARDS

2025	Sullivan Prize Postdoctoral Fellowship
2023	UCAS Outstanding Ph.D. Graduate Award Awarded to the top 5% of Ph.D. graduates from the same graduating year at UCAS
2023	Beijing Outstanding Ph.D. Graduate Award Awarded to the top 5% of Ph.D. graduates from the same graduating year in Beijing
2023	National Scholarship Highest scholarship given by Ministry of Education of the People's Republic of China
2022	Joint PhD Training Program Scholarship, UCAS Scholarship provided by UCAS to fund one year-long visit to Indiana University
2021	Pacemaker to Merit Student, NAOC Awarded to the top 1% of students
2019	Excellent Student Leader, NAOC
2019	Merit Student, NAOC Awarded to the top 20% of students
2018	National Astronomical Observatory Scholarship Scholarship for outstanding undergrads in astronomy research
2018	Outstanding Undergraduate Thesis Award, Shandong University Awarded to 1 student per major
2015-18	Academic scholarship, Shandong University Awarded to the top 30% of students

## OBSERVING PROGRAMS

TNG, HATPS-N, AOT52 (2025B), 10 hours,

Scientific PI: Probing stellar obliquities in the underpopulated Warm Sub-Saturn population

CAHA, CARMENES, 2025B, 1 nights, Scientific PI: Solving the Stellar Obliquity of sub-Saturns

ESO 3.6m, HARPS, P116, 1 nights,

PI: Explore the Unknown: The Stellar Obliquity of Sub-Saturns Around Hot Stars

JWST Cycle 4, 59.6 Primary Spacecraft Hours, CoI:

The Warm Jupiter Opportunity for Understanding Giant Exoplanet Evolution

WIYN, NEID, 2025B, 11 nights, PI: Toward Understanding the 3D Architecture of Warm Giants

WIYN, NEID, 2025A, 12 nights, PI: Characterizing Angles for Warm Giants

WIYN, NEID, 2024B, 12 nights, PI: 3D Architecture of Warm Jupiters

TNG, HARPS-N, 2023B, 1 nights, Scientific PI: HD 80606 b's Spin-Orbit Misalignment Revisited

WIYN, NEID, 2022B, 5 nights, Co-I: Probing Stellar Obliquities with NEID

LCOGT-1m, 2020A, 30 hours, PI, Photometric Follow-Up of Apparent Decaying Orbital WASP-12 b

LCOGT-1m, 2021A, 30 hours, PI, Understanding the shortening period of WASP-12 system

## STUDENTS MENTORING

### Undergraduate:

Colton Romines (second-year undergraduate student at Indiana University) 2024

Jace Rusznak (now graduate student at Penn State University) 2023 - 2025

co-supervised with Songhu Wang

### Graduate

Emma Dugan (graduated student at Indiana University) 2023 - 2025

co-supervised with Songhu Wang

Jiaomei Yang (now PhD Candidate at Beijing Normal University) 2021

## PUBLICATIONS

(8 First or Corresponding\* Author, 6 Second Author, 34 in total, H index=15, Citations=568, 

### First Author:

1. *Unified Kraft Break at  $\sim 6500 K$ : A Newly Identified Single-Star Obliquity Transition Matches the Classical Rotation Break*   
**Xian-Yu Wang**, Songhu Wang, and J. M. Joel Ong. 2025, accepted for publication in **The Astrophysical Journal Letters**
2. *Early Evidence for Polar Orbits of Sub-Saturns Around Hot Stars*   
Emma Dugan, **Xian-Yu Wang\***, Agustin Heron et al. 2025, **The Astrophysical Journal Letters**, 994, L23, as featured by **AAS Press Release**.
3. *From Misaligned Sub-Saturns to Aligned Brown Dwarfs: The Highest  $M_p/M_*$  Systems Exhibit Low Obliquities, Even around Hot Stars*   
Jace Rusznak, **Xian-Yu Wang\***, Malena Rice, Songhu Wang, **The Astrophysical Journal Letters**, 983, L42, as featured by **AAS Nova**.
4. *Single-Star Warm-Jupiter Systems Tend to Be Aligned, Even Around Hot Stellar Hosts: No  $T_{\text{eff}}$ - $\lambda$  Dependency*   
**Xian-Yu Wang**, Malena Rice, Songhu Wang, et al. 2024, **The Astrophysical Journal Letters**, 973, L21, as featured by **AAS Nova**.
5. *The Aligned Orbit of WASP-148b, the Only Known Hot Jupiter with a Nearby Warm Jupiter Companion, from NEID and HIRES*   
**Xian-Yu Wang**, Malena Rice, Songhu Wang, et al. 2022, **The Astrophysical Journal Letters**, 926, L8
6. *Transiting Exoplanet Monitoring Project (TEMP). VI. The Homogeneous Refinement of System Parameters for 39 Transiting Hot Jupiters with 127 New Light Curves* 

**Xian-Yu Wang**, Yong-Hao Wang, Songhu Wang, et al. 2021, **The Astrophysical Journal Supplement Series**, 255, 15

7. *Transiting Exoplanet Monitoring Project (TEMP). IV. Refined System Parameters, Transit Timing Variations and Orbital Stability of the Transiting Planetary System HAT-P-25*   
**Xian-Yu Wang**, Songhu Wang, Tobias Hinse, et al. 2018, **The Publications of the Astronomical Society of the Pacific**, 130, 064401
8. *New analysis of the fraction of observable nights at astronomical sites based on FengYun-2 satellite data*   
**Xian-Yu Wang**, Zhen-Yu Wu, Jing Liu, et al. 2022, **Monthly Notices of the Royal Astronomical Society**, 511, 4

#### Second Author:

9. *The SNR of idealised radial velocity signals*   
David Kipping & **Xian-Yu Wang**. 2024, **Monthly Notices of the Royal Astronomical Society**, 532, 604
10. *TOI-1670 c, a 40 day Orbital Period Warm Jupiter in a Compact System, Is Well Aligned*   
Jack Lubin, **Xian-Yu Wang**, Malena Rice, et al. 2023, **The Astrophysical Journal Letters**, 295, 5
11. *Evidence for Low-Level Dynamical Excitation in Near-Resonant Exoplanet Systems*   
Malena Rice, **Xian-Yu Wang**, Songhu Wang, et al. 2023, **The Astronomical Journal**, 166, 266
12. *The Spin-Orbit Misalignment of TOI-1842b: The First Measurement of the Rossiter-McLaughlin Effect for a Warm Sub-Saturn around a Massive Star*   
Kyle Hixenbaugh, **Xian-Yu Wang**, Malena Rice, Songhu Wang, 2023, **The Astrophysical Journal Letters**, 949, 35, as featured by **AAS Nova**.
13. *Photometric follow-up observations and transit timing analysis of HAT-P-37b*   
Jia-Mei Yang, **Xian-Yu Wang**, Kai Li, et al. 2021, **Publications of the Astronomical Society of Japan**, 73, 1010
14. *Transiting Exoplanet Monitoring Project (TEMP). I. Refined System Parameters and Transit variations of HAT-P-29*   
Songhu Wang, **Xian-Yu Wang**, Yong-Hao Wang, et al. 2018, **The Astronomical Journal**, 156, 181

#### Contributing Author:

15. *The OATMEAL Survey. II. The 3D spin-orbit obliquity of an eccentric transiting brown dwarf in the Ruprecht 147 open cluster*   
Theron W. Carmichael, Steven Giacalone, Noah Vowell and 11 coauthors including **Xian-Yu Wang**, 2025, arXiv:2506.18971. Accepted by AJ.
16. *TOI-880 is an Aligned, Coplanar, Multiplanet System*   
Elina Y. Zhang, Huan-Yu Teng, Fei Dai and 22 coauthors including **Xian-Yu Wang**, 2025, **The Astronomical Journal**, 170, 3, 175.
17. *Migration and Evolution of giant ExoPlanets (MEEP). II. Super-Jupiters and Lithium-rich host stars*   
Jack Schulte, Joseph E Rodriguez, David W. Latham and 29 coauthors including **Xian-Yu Wang**, 2025, **Monthly Notices of the Royal Astronomical Society**, 543, 1, 292.
18. *Evidence for Primordial Alignment II: Insights from Stellar Obliquity Measurements For Hot Jupiters in Compact Multi-planet Systems*   
Brandon T. Radzom, Jiayin Dong, Malena Rice, **Xian-Yu Wang**, et al 2025, **The Astronomical Journal**, 169, 189
19. *SOLES XII. The Aligned Orbit of TOI-2533 b, a Transiting Brown Dwarf Orbiting an F8-type Star*   
Thiago Ferreira, Malena Rice, **Xian-Yu Wang**, Songhu Wang, 2024, **The Astronomical Journal**, 168, 145

20. *Evidence for Primordial Alignment: Insights from Stellar Obliquity Measurements for Compact Sub-Saturn Systems*   
Brandon T. Radzom, Jiayin Dong, Malena Rice, **Xian-Yu Wang**, et al 2024, **The Astronomical Journal**, 168, 116
21. *A hot-Jupiter progenitor on a super-eccentric retrograde orbit*   
Arvind F. Gupta, Sarah C. Millholland, Haedam Im and 53 coauthors including **Xian-Yu Wang**, 2023, **Nature**, 632, 8023, 50.
22. *The PFS view of TOI-677 b: A spin-orbit aligned warm Jupiter in a dynamically hot system*   
Qingru Hu, Malena Rice, **Xian-Yu Wang**, et al 2024, **The Astronomical Journal**, 167, 175
23. *The GAPS Programme at TNG L – TOI-4515 b: An eccentric warm Jupiter orbiting a 1.2 Gyr-old G-star*   
I. Carleo, L. Malavolta, S. Desidera, and 68 coauthors including **Xian-Yu Wang**, 2023, **Astronomy & Astrophysics**, 682, 138
24. *SOLES VII: The Spin-Orbit Alignment of WASP-106 b, a Warm Jupiter Along the Kraft Break*   
Josette Wright, Malena Rice, **Xian-Yu Wang**, et al 2023, **The Astronomical Journal**, 166, 217
25. *The Orbital Architecture of Qatar-6: A Fully Aligned Three-body System?*   
Malena Rice, Songhu Wang, Konstantin Gerbig, and 5 coauthors including **Xian-Yu Wang**, 2023, **The Astronomical Journal**, 165, 65
26. *TOI-1136 is a Young, Coplanar, Aligned Planetary System in a Pristine Resonant Chain*   
Fei Dai, Kento Masuda, Corey Beard and 60 coauthors including **Xian-Yu Wang**, 2023, **The Astronomical Journal**, 165, 33
27. *A Tendency Toward Alignment in Single-star Warm-Jupiter Systems*   
Malena Rice, Songhu Wang, **Xian-Yu Wang** et al. 2022, **The Astronomical Journal**, 164, 104
28. *Revisiting the Full Sets of Orbital Parameters for the XO-3 System: No evidence for Temporal Variation of the Spin-Orbit Angle*   
Keduse Worku, Songhu Wang, Jennifer Burt, and 14 coauthors including **Xian-Yu Wang**, 2022, **The Astronomical Journal**, 163, 158
29. *SOLES I: The Spin–Orbit Alignment of K2-140 b*   
Malena Rice, Songhu Wang, Andrew W. Howard, and 8 coauthors including **Xian-Yu Wang**, 2021, **The Astronomical Journal**, 162, 182
30. *The Aligned Orbit of the Eccentric Warm Jupiter K2-232b*   
Songhu Wang, Joshua N. Winn, Brett C. Addison, and 8 coauthors including **Xian-Yu Wang**, 2021, **The Astronomical Journal**, 162, 50
31. *The Youngest Planet to Have a Spin-Orbit Alignment Measurement AU Mic b*   
Brett C. Addison, Jonathan Horner, Brett C. Addison, and 8 coauthors including **Xian-Yu Wang**, 2021, **The Astronomical Journal**, 162, 137
32. *TOI 564 b and TOI 905 b: Grazing and Fully Transiting Hot Jupiters Discovered by TESS*   
Allen B. Davis, Songhu Wang, Matias Jones, and 54 coauthors including **Xian-Yu Wang**, 2020, **The Astronomical Journal**, 160, 229
33. *HD 202772A b: A Transiting Hot Jupiter Around a Bright, Mildly Evolved Star in Discovered by TESS*   
Songhu Wang, Matias Jones, Avi Shporer, and 57 coauthors including **Xian-Yu Wang**, 2018, **The Astronomical Journal**, 157, 51
34. *A possible giant planet orbiting the cataclysmic variable LX Ser*   
Li Kai, Hu Shaoming, Zhou Jilin and 6 coauthors including **Xian-Yu Wang**, 2017, **Publications of the Astronomical Society of Japan**, 69, 28

## SELECTED TALKS AND CONFERENCES

### Conference Talks:

- \* International Conference on Exoplanets and Planet Formation (EPF) 2025 Dec. 2025  
Distinct Eccentricity - Stellar Obliquity Trends in Three Gas-Giant Mass Regimes
- \* Great Lakes Exoplanet Area Meeting (GLEAM) 2025 Nov. 2025  
A Homogeneous Stellar Obliquity Sample from Global Modeling of Rossiter–McLaughlin Measurements
- \* Know Thy Star, Know Thy Planet 2, Caltech, Pasadena Feb. 2025  
Single-Star Warm-Jupiter Systems Tend to Be Aligned, Even Around Hot Stellar Hosts:  
No  $T_{\text{eff}}$  –  $\lambda$  Dependency
- \* 245th AAS Annual Winter Meeting, National Harbor, Maryland Jan. 2025  
Single-Star Warm-Jupiter Systems Tend to Be Aligned, Even Around Hot Stellar Hosts:  
No  $T_{\text{eff}}$  –  $\lambda$  Dependency
- \* TESS Science Conference III (plenary session), MIT Aug. 2024  
Warm Jupiters Tend to Be Aligned, Even Around Hot Stars,
- \* Emerging Researchers in Exoplanet Science Symposium IX, Cornell University Jul. 2024  
Warm Jupiters Tend to Be Aligned, Even Around Hot Stars,
- \* Exoplanet V, Netherland Jun. 2024  
Tri-Angles: 0°, 90°, 180° — Hot Jupiters’ Signature Spin-Orbit Angles
- \* 243th AAS Annual Winter Meeting (thesis talk), New Orleans Jan. 2024  
Violence or Quiescence Probing Hot Jupiters’ Migration Theories Using Photometric and Spectroscopic Observations
- \* Great Lakes Exoplanet Area Meeting (GLEAM) 2023 Oct. 2023  
Three population in stellar obliquity distribution of hot Jupiters: 0, 90, and 180 degrees
- \* Asia Oceania Geosciences Society (AOGS) Annual Meeting, Aug. 2023  
Observational and Theoretical Aspects of Exoplanets, Singapore  
*3D Configuration of a Compact Multi-giant System Lying at the Stability Boundary*
- \* Emerging Researchers in Exoplanet Science VII, The Pennsylvania State University Aug. 2022  
*The Aligned Orbit of WASP-148b and the statistic implications from the distribution of stellar sky-projected obliquities*
- \* Annual Conference of the Chinese Astronomical Society, Nanchong, China Dec. 2021  
*Transiting Exoplanet Monitoring Project (TEMP)*
- \* Annual Conference of the Chinese Astronomical Society, Nanchong, China Dec. 2021  
*The Aligned Orbit of WASP-148b*

### Seminar and Lunch Talks:

- \* Astronomy Seminar, Westlake University, Zhejiang June. 2025
- \* ZJU IA Spring Seminar, Zhejiang University, Zhejiang June. 2025
- \* TDLI Seminar, Tsung-Dao Lee Institute, Shanghai June. 2025
- \* SHAO lunch talk, Shanghai Astronomical Observatory, Shanghai June. 2025
- \* PMO Youth Forum, Purple Mountain Observatory, Nanjing June. 2025
- \* Exoplanet lunch talk, Nanjing University, Nanjing June. 2025
- \* Astrop-ph Seminar, Peking University, Beijing May. 2025
- \* PDS Seminar, Tsinghua University, Beijing May. 2025

- \* Youth Innovation Promotion Association academic Seminar, NAOC, Beijing May. 2025
- \* CIERA - Northwestern University, Evanston, IL Mar. 2025
- \* Harvard CfA Exoplanet Pizza Lunch, Cambridge, MA Nov. 2024
- \* David Charbonneau Group Meeting, Cambridge, MA Nov. 2024
- \* Tea Talk, Indiana University Bloomington Apr. 2024
- \* Tea Talk, Indiana University Bloomington Sep. 2022
- \* Lunch talk, South-Western Institute For Astronomy Research, Kunming, China Mar. 2022

### **Conference Posters:**

- \* Poster, Emerging Researchers in Exoplanet Science Symposium VIII, New Heaven Homogeneous Studies on the Stellar Obliquities Jun. 2023
- \* Poster, 54<sup>th</sup> Division on Dynamical Astronomy, Michigan May. 2023  
3D configuration of a compact multi-giant system lying at the stability boundary

### **SERVICE AND OUTREACH**

- \* Referee for AJ, ApJ, and ApJL
- \* Referee for ESO Period Call proposals
- \* Referee for Gemini Proposal
- \* Special Issue Editor for “Formation and Evolution of Exoplanets” in *Universe*.
- \* AAS 243, Session Chair for *Exoplanet Searches and Surveys II* Jan. 2024
- \* AAS 243, Judge for *Chambliss Astronomy Achievement Student Award* poster competition Jan. 2024
- \* GLEAM 2023 Conference, Member of SOC & LOC, and Session Chair Jul. 2023
- \* Donation Organizer  
organized a successful donation drive, providing 200+ astronomy books Jun. 2021  
to underprivileged students in rural areas.
- \* Member of the Graduate Student Council  
organized communication activities between graduate students of National Astronomical Observatory of China and Beijing Institute of Genomics 2021

### **TEACHING**

Indiana University Bloomington

- \* AST-A 100 The Solar System 2024
- \* AST-A 100 The Solar System 2023

University of Chinese Academy of Sciences

- \* Stellar Structure and Evolution, Teaching assistance 2019

Shandong University

- \* Optics, Teaching assistance 2015