Shangjia Zhang

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Employment

Columbia University in the City of New York — New York, New York
NASA Hubble Fellowship Program Sagan Fellow — Aug 2024–Aug 2027

University of Nevada, Las Vegas — Las Vegas, Nevada
Graduate Research/Teaching Assistant — Aug 2018–May 2024

Education

University of Nevada, Las Vegas — Las Vegas, Nevada
Ph.D. in Astronomy, Advisor: Prof. Zhaohuan Zhu — Sep 2018–May 2024

University of Michigan, Ann Arbor — Ann Arbor, Michigan
B.S. in Astronomy and Physics, Advisor: Prof. Lee Hartmann — 2016–2018

- GPA: 4.0/4.0, with Highest Distinction

Nanjing University — Nanjing, China
B.S. in Astronomy — 2014–2016

- GPA: 4.61 / 5.00, Rank No.1 (1/46)

Selected Grants and Awards

- **2024 IAU PhD Prize Division F Honourable Mention** — 2025
- **Principal Investigator of ALMA Cycle 11 Proposal** — 2024
  Probing radial dependence of midplane turbulence in a seven-ringed disk (2024.1.00581.S)
- **UNLV Outstanding Spring 2024 Graduates** — 2024
  Honored by the president in the commencement as the only Ph.D. student
- **Flatiron Institute Research Fellow (Center for Computational Astrophysics)** — 2027–2028
- **NASA Hubble Fellowship Program (NHFP) Sagan Fellow** — 2024–2027
  ∼ 320,000 USD + 150,000 SBU supercomputer node hours / year
- **Future Investigators in NASA Earth and Space Science and Technology** — 2021–2024
  (FINESST) 135,000 USD + 200,000 SBU supercomputer node hours / year
- **UNLV Russell L. and Brenda Frank Scholarship** (7,000 USD) — 2022–2024
- **UNLV Barrick Graduate Fellowship** (30,000 USD) — 2020–2021
- AAS International Travel Grant (1,700 USD) — 2023
- UNLV GPSA Travel Fund (5,000 USD) — 2023
- OISS Distinguished Contribution Award (1,000 USD) — 2023
- Bronze Medal, 7th International Olympiad on Astronomy and Astrophysics — Volos, Greece, 2013

Selected Service and Outreach

2025 NSF AAG Review Panel 2025

Referee of ApJL, ApJ, MNRAS, and PASJ (12 in total) 2019–Current

SOC of 2024 NHFP Symposium at Caltech Sep 2024

Mentor of AMP-UP (Astronomy Mentorship Program for Upcoming Postdocs) 2024–Current

Co-founder, Speaker, and Webmaster, Astronomy on Tap, Las Vegas (∼1/season) 2018–2024

Judge of Beal Bank Science Fair Mar 2022, 2023, 2024

Visualization Specialist Sep 2020–Mar 2021

Help render simulations to planetarium shows, Beijing Planetarium

Speaker at Public Science Seminar Feb 2021

"Mars exploration and planet formation" (in Chinese ∼200 general public audience), Beijing Planetarium

Author for Amateur Astronomer Magazine (in Chinese) Oct 2020

"GW Ori: ALMA observation of an interesting three-body system"

Sole Organizer UNLV Astro Coffee and Astro Journal Club 2019–2020

Presenter UNLV Art in Science Exhibition Jan 2020

AAS Astronomy Ambassador Program Jan 2019

Sole Organizer Lunar Eclipse on the Strip, Las Vegas Jan 2019

Teaching

- **Guest Lecturer** Columbia University Graduate Seminar Spring 2025
- **Guest Lecturer** Computational Physics, UNLV Spring 2024
- **Lecturer & Grader** Astro 105: Introductory Astronomy Laboratory Spring 2020
- **Lecturer & Grader** Physics 151 L: General Physics I (Mechanics & Thermal Physics) Spring 2019

Publications

All paper (34/35 on ADS) citations: 3,984, h-index: 20; **first-author citations**: 566, h-index: 9.

First Author Publications:

1. **Zhang**, S., Zhu, Z. & Fairbairn, C. W. Shadow-induced Warps in Protoplanetary Disks. *ApJL* **995,** L33. arXiv: 2511.11358 [astro-ph.EP] (Dec. 2025).
2. **Zhang**, S. & Zhu, Z. 3D Radiation-hydrodynamical Simulations of Shadows on Transition Disks. *ApJL* **974,** L38. arXiv: 2409.08373 [astro-ph.EP] (Oct. 2024).
3. **Zhang**, S., Zhu, Z. & Jiang, Y.-F. Thermal Structure Determines Kinematics: Vertical Shear Instability in Stellar Irradiated Protoplanetary Disks. *ApJ* **968,** 29. arXiv: 2404.05608 [astro-ph.EP] (June 2024).

4. **Zhang**, S., Kalscheur, M., Long, F., *et al.* Substructures in Compact Disks of the Taurus Star-forming Region. *ApJ* **952,** 108. arXiv: 2305.03862 [astro-ph.EP] (Aug. 2023).
5. **Zhang**, S., Zhu, Z., Ueda, T., *et al.* Porous Dust Particles in Protoplanetary Disks: Application to the HL Tau Disk. *ApJ* **953,** 96. arXiv: 2306.00158 [astro-ph.EP] (Aug. 2023).
6. **Zhang**, S., Zhu, Z. & Kang, M. PGNets: planet mass prediction using convolutional neural networks for radio continuum observations of protoplanetary discs. *MNRAS* **510,** 4473–4484. arXiv: 2111.15196 [astro-ph.EP] (Mar. 2022).
7. **Zhang**, S., Hu, X., Zhu, Z., *et al.* Self-consistent Ring Model in Protoplanetary Disks: Temperature Dips and Substructure Formation. *ApJ* **923,** 70. arXiv: 2110.00858 [astro-ph.EP] (Dec. 2021).
8. **Zhang**, S. & Zhu, Z. The effects of disc self-gravity and radiative cooling on the formation of gaps and spirals by young planets. *MNRAS* **493,** 2287–2305. arXiv: 1911.01530 [astro-ph.EP] (Apr. 2020).
9. **Zhang**, S., Zhu, Z., Huang, J., *et al.* The Disk Substructures at High Angular Resolution Project (DSHARP). VII. The Planet-Disk Interactions Interpretation. *ApJL* **869,** L47. arXiv: 1812.04045 [astro-ph.EP] (Dec. 2018).
10. **Zhang**, S., Hartmann, L., Zamora-Avilés, M., *et al.* On estimating angular momenta of infalling protostellar cores from observations. *MNRAS* **480,** 5495–5503. arXiv: 1808.04802 [astro-ph.GA] (Nov. 2018).

Contributing Author Publications:

11. Baronett, S. A., Jiang, Y.-F., Zhu, Z., *et al.* A Framework to Model Stellar Irradiated Disks with Frequency-dependent Absorption and Scattering Opacities in Athena++, submitted (Aug. 2025).
12. Jiang, H., Long, F., Macías, E., *et al.* Puffed-up Inner Rings and Razor-thin Outer Rings in Structured Protoplanetary Disks. *arXiv e-prints.* arXiv: 2509.13122 [astro-ph.EP] (Sept. 2025).
13. Li, J., Close, L. M., Long, F., *et al.* Discovery of Hα Emission from a Protoplanet Candidate around the Young Star 2MASS J16120668–3010270 with MagAO-X. *ApJL* **990,** L70. arXiv: 2508.11155 [astro-ph.EP] (Sept. 2025).
14. Uyama, T., Ricci, L., Ygouf, M., *et al.* JWST/NIRCam Coronagraphic Search for Hidden Planets in the HD 163296 Protoplanetary Disk. *AJ* **169,** 287. arXiv: 2503.20132 [astro-ph.EP] (June 2025).
15. Zhu, Z., **Zhang**, S. & Johnson, T. M. Asymmetric Temperature Variations In Protoplanetary Disks. I. Linear Theory, Corotating Spirals, and Ring Formation. *ApJ* **980,** 259. arXiv: 2412.09571 [astro-ph.EP] (Feb. 2025).
16. Huang, J., Ansdell, M., Birnstiel, T., *et al.* High-resolution ALMA Observations of Richly Structured Protoplanetary Disks in σ Orionis. *ApJ* **976,** 132. arXiv: 2410.03823 [astro-ph.EP] (Nov. 2024).
17. Wallack, N. L., Ruffio, J.-B., Ruane, G., *et al.* A Survey of Protoplanetary Disks Using the Keck/NIRC2 Vortex Coronagraph. *AJ* **168,** 78. arXiv: 2408.04048 [astro-ph.EP] (Aug. 2024).
18. Long, F., Andrews, S. M., **Zhang**, S., *et al.* ALMA Detection of Dust Trapping around Lagrangian Points in the LkCa 15 Disk. *ApJL* **937,** L1. arXiv: 2209.05535 [astro-ph.EP] (Sept. 2022).

19. Burrill, B. P., Ricci, L., Harter, S. K., *et al.* Investigating the Future Potential of an Upgraded ALMA to Image Planet-forming Disks at Sub-astronomical-unit Scales. *ApJ* **928,** 40. arXiv: 2202.08348 [astro-ph.EP] (Mar. 2022).

20. Andrews, S. M., Elder, W., **Zhang**, S., *et al.* Limits on Millimeter Continuum Emission from Circumplanetary Material in the DSHARP Disks. *ApJ* **916,** 51. arXiv: 2105.08821 [astro-ph.EP] (July 2021).

21. Ueda, T., Kataoka, A., **Zhang**, S., *et al.* Impact of Differential Dust Settling on the SED and Polarization: Application to the Inner Region of the HL Tau Disk. *ApJ* **913,** 117. arXiv: 2104.05927 [astro-ph.EP] (June 2021).

22. Jorquera, S., Pérez, L. M., Chauvin, G., *et al.* A Search for Companions via Direct Imaging in the DSHARP Planet-forming Disks. *AJ* **161,** 146. arXiv: 2012.10464 [astro-ph.EP] (Mar. 2021).

23. Harter, S. K., Ricci, L., **Zhang**, S., *et al.* Imaging the Dusty Substructures due to Terrestrial Planets in Planet-forming Disks with ALMA and the Next-generation Very Large Array. *ApJ* **905,** 24. arXiv: 2011.08279 [astro-ph.EP] (Dec. 2020).

24. Huang, J., Andrews, S. M., Dullemond, C. P., *et al.* A Multifrequency ALMA Characterization of Substructures in the GM Aur Protoplanetary Disk. *ApJ* **891,** 48. arXiv: 2001.11040 [astro-ph.EP] (Mar. 2020).

25. Zhu, Z., **Zhang**, S., Jiang, Y.-F., *et al.* One Solution to the Mass Budget Problem for Planet Formation: Optically Thick Disks with Dust Scattering. *ApJL* **877,** L18. arXiv: 1904.02127 [astro-ph.EP] (June 2019).

26. Isella, A., Huang, J., Andrews, S. M., *et al.* The Disk Substructures at High Angular Resolution Project (DSHARP). IX. A High-definition Study of the HD 163296 Planet-forming Disk. *ApJL* **869,** L49. arXiv: 1812.04047 [astro-ph.SR] (Dec. 2018).

27. Dullemond, C. P., Birnstiel, T., Huang, J., *et al.* The Disk Substructures at High Angular Resolution Project (DSHARP). VI. Dust Trapping in Thin-ringed Protoplanetary Disks. *ApJL* **869,** L46. arXiv: 1812.04044 [astro-ph.EP] (Dec. 2018).

28. Pérez, L. M., Benisty, M., Andrews, S. M., *et al.* The Disk Substructures at High Angular Resolution Project (DSHARP). X. Multiple Rings, a Misaligned Inner Disk, and a Bright Arc in the Disk around the T Tauri star HD 143006. *ApJL* **869,** L50. arXiv: 1812.04049 [astro-ph.SR] (Dec. 2018).

29. Kurtovic, N. T., Pérez, L. M., Benisty, M., *et al.* The Disk Substructures at High Angular Resolution Project (DSHARP). IV. Characterizing Substructures and Interactions in Disks around Multiple Star Systems. *ApJL* **869,** L44. arXiv: 1812.04536 [astro-ph.SR] (Dec. 2018).

30. Guzmán, V. V., Huang, J., Andrews, S. M., *et al.* The Disk Substructures at High Angular Resolution Program (DSHARP). VIII. The Rich Ringed Substructures in the AS 209 Disk. *ApJL* **869,** L48. arXiv: 1812.04046 [astro-ph.SR] (Dec. 2018).

31. Andrews, S. M., Huang, J., Pérez, L. M., *et al.* The Disk Substructures at High Angular Resolution Project (DSHARP). I. Motivation, Sample, Calibration, and Overview. *ApJL* **869,** L41. arXiv: 1812.04040 [astro-ph.SR] (Dec. 2018).

32. Huang, J., Andrews, S. M., Dullemond, C. P., *et al.* The Disk Substructures at High Angular Resolution Project (DSHARP). II. Characteristics of Annular Substructures. *ApJL* **869,** L42. arXiv: 1812.04041 [astro-ph.EP] (Dec. 2018).

33. Huang, J., Andrews, S. M., Pérez, L. M., *et al.* The Disk Substructures at High Angular Resolution Project (DSHARP). III. Spiral Structures in the Millimeter Continuum of the Elias 27, IM Lup, and WaOph 6 Disks. *ApJL* **869,** L43. arXiv: 1812.04193 [astro-ph.SR] (Dec. 2018).

34. Birnstiel, T., Dullemond, C. P., Zhu, Z., *et al.* The Disk Substructures at High Angular Resolution Project (DSHARP). V. Interpreting ALMA Maps of Protoplanetary Disks in Terms of a Dust Model. *ApJL* **869,** L45. arXiv: 1812.04043 [astro-ph.SR] (Dec. 2018).

35. Li, J.-T., Bregman, J. N., Wang, Q. D., *et al.* The Circum-Galactic Medium of Massive Spirals. II. Probing the Nature of Hot Gaseous Halo around the Most Massive Isolated Spiral Galaxies. *ApJS* **233,** 20. arXiv: 1710.07355 [astro-ph.GA] (Dec. 2017).

Selected Talks

- Berkeley TAC Seminar (Invited) — Berkeley, CA, Nov 2025
- 2025 NHFP Symposium — Baltimore, MD, Oct 2025
- New York Area Exoplanets Meeting — New York, NY, May 2025
- KITP Conference: Planets on Edge — Santa Barbara, CA, Apr 2025
- 2024 NHFP Symposium — Pasadena, CA, Sep 2024
- Carnegie EPL Astro Seminar (Invited) — Washington DC, Sep 2024
- 50 years of Binaries and Discs: Lubow@75 — Las Vegas, NV, May 2024
- U. Chicago Geo. Sci. Seminar (Invited) — Chicago, IL, Dec 2023
- TCAN Meeting (Invited) — Tuscon, AZ, Nov 2023
- Princeton Thunch — Princeton, NJ, Oct 2023
- NRAO TUNA Talk — Charlottesville, VA, Oct 2023
- UW-Madison Monday Science Seminar (Invited) — Madison, WI, Oct 2023
- U. of Hawaii SPLAT (Invited) — Honolulu, HI, Sep 2023
- CfA SMA Seminars — Cambridge, MA, Sep 2023
- Harvard ITC Luncheon — Cambridge, MA, Sep 2023
- Origins Seminars — Tuscon, AZ, Sep 2023
- Emerging Researchers in Exoplanet Science (ERES) — New Haven, CT, Jun 2023
- Athena++ workshop — New York, NY, May 2023
- Planet Formation Group Meeting — Flatiron Institute (online), Jan 2023
- Planet Formation Group Meeting — U. Victoria (online), Feb 2022
- Star and Planet Formation Seminar (Invited) — UMich (online), Feb 2022
- Caltech Direct Imaging Group Meeting (Invited) — Caltech (online), Dec 2021
- New paradigms for radiatively efficient accretion disks — New York, NY, Dec 2021
- Star Formation: From Clouds to Discs (Invited) — Malahide, Ireland, Oct 2021
- Five years after HL Tau: a new era in planet formation — (online), Dec 2020
- New Horizons in Planetary Systems — Victoria, BC, Canada, May 2019

- 233rd AAS Meeting — Seattle, WA, Jan 2019
- Peking U. KIAA SPF Group Meeting (Invited) — Beijing, China, Dec 2018

Selected Press Release

- ALMA Reveals Planets Can Form Under Harsh Radiation — NRAO News
- UNLV Congratulates Outstanding Spring 2024 Graduates — UNLV News
- Ph.D. Candidate Turns Childhood Love of Night Sky Into Studying Protoplanetary Disks — UNLV News
- It's a Planet: New Evidence of Baby Planet in the Making — CfA News
- The Birth of Worlds Stunning new images of young planetary systems create a profound cosmic perspective — Scientific American
- Stunning high-resolution images of disks swirling around 20 young stars outside of our solar system reveal new clues on planet formation — Daily Mail
- The Epoch of Planet Formation, Times Twenty — NRAO News
- UNLV Study Unlocks Clues to How Planets Form — UNLV News

Student Advising

- **Stanley Baronett** (PhD student at UNLV)
  Project: *On multi-band radiation-hydrodynamics in protoplanetary disks.* Starting from the frequency-integrated radiation transport I worked on and exploring the multi-frequency nature of protoplanetary disk thermodynamics. Co-advised with Prof. Zhaohuan Zhu, Dr. Yan-Fei Jiang, and Prof. Phil Armitage. An ongoing project.
- **Sarah Harter** (Undergraduate student at CSUN, now graduate student at U. Rochester)
  Project: *Imaging the Dusty Substructures due to Terrestrial Planets in Planet-forming Disks with ALMA and the Next-generation Very Large Array.* Co-advised with Prof. Luca Ricci, led to a publication in ApJ.
- **Fiona Han** (Undergraduate student at University of Michigan)
  Project: *Producing synthetic observations of protosellar cores using global simulations.* Co-advised with Prof. Lee Hartmann and resulted in a poster presentation at the Astronomy Undergraduate Poster Session at the University of Michigan.
- **Xiaoyi Ma** (PhD Student at KIAA, Peking University)
  Project: *Thermal Response to Shadows in Protoplanetary Disks: The Role of Competing Timescales.* Modeling the thermal responses of the disk in mm dust continuum and gas line emission due to shadowing in the near-IR scattered lights.
- **Bronco Yang** (Undergraduate student at Columbia University, now graduate student at Rice University)
  Project: *Roles of planet accretion heating on gap opening.* Using Athena++ to study planet-disk interactions considering the heating by planet accretion in 2D locally isothermal disks.