

## EDUCATION

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### University of Nevada, Las Vegas

Ph.D. in Astronomy, Advisor: Prof. Zhaohuan Zhu

Las Vegas, Nevada

2018–Current

### University of Michigan, Ann Arbor

B.S. in Astronomy and Physics, Advisor: Prof. Lee Hartmann

Ann Arbor, Michigan

2016–2018

– GPA: 4.0/4.0, with Highest Distinction

### Nanjing University

B.S. in Astronomy

Nanjing, China

2014–2016

– GPA: 4.61 / 5.00, Rank No.1 (1/46)

## PUBLICATIONS

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All paper (**26 on ADS**) citations: 2658, h-index: 17; first-author citations: 370, h-index: 6.

### Leading Author Publications:

1. **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).
2. **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).
3. **Zhang**, S., Zhu, Z. & Kang, M. PG-Nets: 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).
4. **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).
5. **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).
6. 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).
7. **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).
8. **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:

9. Wallack, N. L., Ruffio, J.-B., Ruane, G., *et al.* A Survey of Protoplanetary Disks Using the Keck/NIRC2 Vortex Coronagraph. *ApJ*, in press (2023).
10. 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).
11. 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).
12. 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).
13. 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).
14. 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).
15. 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).
16. 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).
17. 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).
18. 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).
19. 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).
20. 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).
21. 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).
22. 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).

23. 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).
24. 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).
25. 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).
26. 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).

### Paper in Preparation:

1. **Zhang**, S., Zhu, Z. Jiang, Y.-F. Vertical Shear Instability with Stellar Irradiation in Protoplanetary Disks

### SELECTED TALKS

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|---|---------------------------------------|
| • Princeton Thunch  | Princeton, NJ, Oct 2023               |
| • NRAO TUNA Talk  | Charlottesville, VA, Oct 2023         |
| • UW-Madison Monday Science Seminar                       | Madison, WI, Oct 2023                 |
| • U. of Hawaii SPLAT Talk                                 | 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                       | UMich (online), Feb 2022              |
| • Caltech Direct Imaging Group                            | Caltech (online), Dec 2021            |
| • New paradigms for radiatively efficient accretion disks | New York, NY, Dec 2021                |
| • Star Formation: From Clouds to Discs                    | 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                        | Beijing, China, Dec 2018              |

## SELECTED POSTERS

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- GRC and GRS Origins of Solar Systems South Hadley, MA, Jun 2023
- Protostars and Planets VII Kyoto, Japan, Apr 2023
- Exoplanet IV Las Vegas, NV, May 2022
- Kepler and K2 Science Conference V Glendale, CA, Mar 2019
- 231st AAS Meeting Washington, DC, Jan 2018
- Astronomy Undergraduate Poster Session Ann Arbor, MI, Apr 2017

## SELECTED PRESS RELEASE

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- New Evidence Of A Baby Planet In The Making [SpaceRef](#)
- 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](#)

## SELECTED GRANTS AND AWARDS

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- **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 (2,500 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

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- **Referee** of ApJL, ApJ, MNRAS, and PASJ (5 in total) 2019–Current
- **Co-founder, [Speaker](#), and Webmaster**, Astronomy on Tap, Las Vegas (~1/season) 2018–Current
- **Judge of Beal Bank Science Fair** Mar 2022, 2023
- **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

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- **Lecturer & Grader** Astro 105: Introductory Astronomy Laboratory Spring 2020
- **Lecturer & Grader** Physics 151 L: General Physics I (Mechanics & Thermal Physics) Spring 2019

## STUDENT ADVISING

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- **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 protostellar 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.
- **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 and Dr. Yan-Fei Jiang. An ongoing project.

## SKILLS

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- **General:** (Radiation)-Hydrodynamics, Monte Carlo Radiative Transfer, Deep Neural Networks
- **Languages:** C, C++, Python, IDL, Linux/Unix, L<sup>A</sup>T<sub>E</sub>X, MPI, OpenMP, CUDA
- **Softwares:** Athena++, FARGO, FLASH, LIME, RADMC3D, Tensorflow