Dr. Rixin Li

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Professional Appointments

- **51 Pegasi b Postdoctoral Fellow** 08/2023 – Present
  Department of Astronomy, University of California, Berkeley
- **Postdoctoral Research Associate** 2020 – 2023
  The Cornell Center for Astrophysics and Planetary Science (CCAPS), Cornell University
- **NASA Earth and Space Science Graduate Research Fellow** 2016 – 2019
  Department of Astronomy, University of Arizona

Education

- Ph.D. in Astronomy & Astrophysics, University of Arizona 2014 – 2020
  Advisor: Andrew Youdin
  Thesis: *Simulating Planetesimal Formation in the Kuiper Belt and Beyond*
- B.Sc. in Astronomy, Peking University 2010 – 2014

Research Interests

Planet formation; The solar system; Dynamics of exoplanets, dusty protoplanetary disks, object-disk interactions, and gravitational wave sources; Computational and theoretical astrophysics

Honors and Awards

- 51 Pegasi b Postdoctoral Fellowship, Heising-Simons Foundation ($415k) 2023 – 2026
  An additional $138k can be applied as a new grant when I receive a faculty or permanent staff position, as stated in the award letter.
- Director's Postdoctoral Fellowship, Los Alamos National Laboratory ($220k, declined) 2023
- Departmental Scholarship Award, College of Science, University of Arizona 2020
- NASA Earth and Space Science Fellowship (NESSF), NASA ($99k) 2016 – 2019
- Theoretical Astrophysics Program Small Matching Grants, U. of Arizona ($1.5k) 2015
- College of Science Fellowship, University of Arizona ($17k) 2014 – 2015
- Study Abroad Scholarship for Excellent Students, China Scholarship Council 2013
- First Lin-Qiao Prize for Excellent Undergraduate Research, Peking University 2012
- National Creative Research Fund for Undergraduate Research, Peking University 2012
- Scholarship for Outstanding Students, National Astronomical Observatories of China 2011

Selected Grants and Programs

- **Sci PI**: 2023 – 2026 51 Pegasi b Fellowship, Heising-Simons Foundation ($415k)
  Toward a Coherent Picture of Planet Formation
- **PI**: 2024 – 2026 ACCESS Allocaiton (`PHY240264`, 4.5 Million CPU Hours)
  Late Formation of the Cold Classical Kuiper Belt
- **Co-I**: ALMA Cycle 12 (`2025.1.00444.S`, PI: P. Pinilla)
  Dust Leakage Through Gaps of Transition Disks and its Influence on the Inner Disk Composition
- **Co-I**: ALMA Cycle 11 (`2024.1.00902.S`, PI: F. Long)
  Connecting Inner and Outer Disks around Very Low Mass Objects
- **Co-I**: NOIRlab 2024A (15.7 hours on WIYN/NEID, PI: C. Pittman)
  Measuring the Propensity for In-Situ Terrestrial Planet Formation around Slowly-Accreting Stars
- **Co-I**: ALMA Cycle 10 (`2023.1.00946.S`, PI: F. Long)
  Tracing the Evolution of Substructures: A High-resolution Survey of Old Upper Sco Disks
- **Co-I**: *JWST* Cycle 2 (`GO-03153`, PI: F. Long)
  Why Do Some 50 Myr old Stars Still Accrete?
- **Co-I**: ALMA Cycle 9 (`2022.1.00646.S`, PI: F. Long)
  Tracing the Evolution of Substructures: A High-resolution Survey of Old Upper Sco Disks
- **Co-I**: 2022 – 2023 ACCESS Allocation (`AST120062`, 29 Million CPU Hours, PI: J. Simon)
  Numerical Simulations of Planetesimal Formation

Selected Talks

- 12/2025: **Invited** talk, *Exoplanets and Planet Formation (EPF 2025)*, Tsung-Dao Lee Institute
- 09/2025: Contributed talk, *Bay Area Planetary Science meeting*, Stanford University
- 08/2025: **Invited** talk, *CIERA Fellows at 15*, CIERA/Northwestern University
- 08/2024: **Invited** talk, *2025 51 Pegasi b Summit*, Half Moon Bay, CA, USA
- 07/2025: Contributed talk, *Detection and Dynamics of Exoplanets*, University of Coimbra, Portugal
- 06/2025: **Invited** talk, *Astrophysical Dynamics: Planets to Stars/Black Holes*, Niels Bohr Institute
- 06/2025: Contributed talk, *Dynamics with Dissipation*, Cambridge, UK
- 05/2025: Contributed talk, *The 56rd DDA Meeting*, Georgia Tech
- 05/2025: Contributed talk, *Planets on the Edge*, the Kavli Institute for Theoretical Physics (KITP)
- 02/2025: **Invited** colloquium talk, San Francisco State University
- 08/2024: **Invited** talk, *New Ideas on the Origin of Black Hole Mergers*, Niels Bohr Institute
- 06/2024: **Invited** colloquium talk, Peking University
- 06/2024: **Invited** Seminar talk, Tsinghua University

- 04/2024: **Invited** IGPP Seminar talk, UC Santa Cruz
- 03/2024: **Invited** Seminar talk, CIERA/Northwestern University
- 01/2024: **Invited** colloquium talk, Xiamen University
- 12/2023: **Invited** talk, *RESCEU-NBIA Workshop on Gravitational-wave Sources*, Tokyo, Japan
- 11/2023: **Invited** seminar talks, the University of Michigan
- 11/2023: **Invited** talk, *TCAN Disk Hydro & Planet Formation Workshop*, University of Arizona
- 10/2023: **Invited** talk, *Bash Symposium 2023*, the University of Texas at Austin
- 05/2023: Seminar talk, *Astrophysics Coffee*, Institute for Advanced Study
- 04/2023: **Invited** seminar talk, *Exoplanet Lunch*, Princeton University
- 04/2023: Contributed talk, *Cornell Exoplanet Conference*, Cornell University
- 02/2023: **Invited** seminar talk, *Exoplanets & Stars Seminar*, Yale University
- 02/2023: **Invited** seminar talk, *Earth 2.0 Science Seminar Series* (virtual)
- 11/2022: **Invited** seminar talk, Center for Relativistic Astrophysics, Georgia Tech
- 11/2022: **Invited** seminar talk, Iowa State University (virtual)
- 07/2022: Contributed Talk, *OWL Exoplanet Summer Program*, UC Santa Cruz
- 06/2022: **Invited** talk, *Planets in the Desert - A Streaming Instability Code Comparison* (virtual)
- 06/2022: **Invited** seminar talk, The Center for Astrochemical Studies, MPE, Germany (virtual)
- 04/2022: **Invited** talk, *The 53rd DDA Meeting*, CCA, Flatiron Institute
- 04/2022: **Invited** discussion talk, *Stellar and Black Hole Binary Accretion and Evolution*, KITP
- 11/2020: **Invited** talk, *Planetesimal Formation Meeting*, Lund University, Sweden (virtual)
- 10/2020: **Invited** talk, *Earth 2.0 Transit Survey Space Mission Science Meeting*, China (virtual)
- 11/2019: **Invited colloquium** talk, New Mexico State University
- 07/2019: **Invited** talk, *Turbulence in PPDs Meeting*, Ringberg, Germany
- 07/2019: Seminar talk, *Planet and Star Formation Coffee*, MPIA, Germany
- 06/2019: Contributed talk, *From Star to Planet II*, Gothenburg, Sweden
- 05/2019: Contributed talk, *New Horizons in Planetary Systems*, Victoria, Canada

Selected Services

- Referee for Nature Astronomy, AAS Journals (ApJ, ApJL), MNRAS, MNRAS Letters, Astronomy & Astrophysics, and Icarus, 22 papers in total
- Reviewer for 10 NASA panels, including Exoplanet Research Program (XRP), Emerging Worlds (EW), FINESST Fellowship, and a mission-related program
- Panelist for *Hubble Space Telescope* and *James Webb Space Telescope* proposal reviews
- Theoretical Astrophysics Center Seminar Committee Member at UC Berkeley (since 2024 Spring)

- Organizing Committee Member for *Emerging Researchers in Exoplanetary Science 2023 & 2024* (See our *Bulletin of the AAS* article on *Lessons Learned in Conference Organization*)
- External Member for 2023 Graduate Admission Committee, Cornell University
- Local Organizing Committee Member for *Star and Planet Formation in the Southwest 2* in 2018
- Steward Observatory *Astro-ph Science Coffee* discussion host for 2016 – 2019

Teaching Experience

- Astronomy 7A, Fall 2023 — *Introduction to Astrophysics: Stars & Planets* UC Berkeley
  Guest Lecturer for a 90-min lower division class
- ASTRO 6531, Spring 2023 — *Astrophysical Fluid Dynamics* Cornell University
  Guest Lecturer for a 75-min graduate-level class
- ASTR 400B, Spring 2020 — *Galactic, Extra-Galactic Astronomy & Cosmology* U. of Arizona
  Teaching Assistant
  Duties: 1) gave a 75-min lecture; 2) advised term projects; 3) grading; 4) led computational labs
- PHYS 105A, Fall 2015 — *Introduction to Scientific Computation* U. of Arizona
  Teaching Assistant for two sessions
  Duties: 1) grading; 2) led computational labs

Student Mentoring

- Konstantin Gerbig, previous graduate student at Yale University
  One student-led paper published: Gerbig & Li (2023).
- J. T. Laune, previous graduate student at Cornell University
  One student-led paper published: Laune, Li & Lai (2024).
- Sabina Sagynbayeva, graduate student at Stony Brook University
  One student-led paper published: Sagynbayeva, Li, et al. (2025).
- Philip Kirkeberg, graduate student at University of Copenhagen
  One student-led paper submitted: Kirkeberg, Li & Pessah (2026).
- Yi-Xian Chen, graduate student at Princeton University (previously undergrad at Tsinghua Univ.)
  Two student co-authored papers published: Li, Chen & Lin (2022, 2024)

Selected Outreach

- Mentor of the 2024 Astronomy Mentorship Program for Upcoming Postdocs (AMP-UP)
- Outreach talk: *Fun, Interactive, and Sharable Scientific Visualization* in 08/2023
- Fuertes Observatory Public Lecture Series in 03/2023: *The Story of Minor Planets*
- Member of the Cornell Astronomical Society, attending public viewing open house 2021 – 2023
- Member of Tucson Initiative for Minority Engagement in Science and TEchnology Program (TIMESTEP) for 2018 – 2020

Publications

11 first-author papers, 4 student-led papers, 33 total publications (as of July 3, 2026).

h-index: 19 (ADS), 20 (Google); total citations: 1696 (ADS), 2010 (Google)

ADS, Google Scholar, ORCID: 0000-0001-9222-4367

(*: graduate/undergraduate student whom I mentored)

First-author articles

11. **Li, R.** & Chiang, E., *The Edges of Planetary Systems: Falling Off the Kuiper Cliff in a Dissipating Gas Disk* , **2026**, submitted to ApJ, arXiv:2606.14704
10. **Li, R.** & Chiang, E., *In-Situ Formation of the Cold Classical Kuiper Belt*, **2025**, ApJ, 995, 214
9. **Li, R.**, Chiang, E., Choksi, N., & Dai, F., *The Resonant Remains of Broken Chains from Major and Minor Mergers*, **2025**, AJ, 169, 323
8. **Li, R.**, *Chen, Y.-X., & Lin, D., *Dust Accumulation near the Magnetospheric Truncation of Protoplanetary Discs: II. The Effects of Dust Opacity*, 2024, MNRAS, 529, 893
7. **Li, R.** & Lai, D., *Hydrodynamical Evolution of Black-Hole Binaries Embedded in AGN Discs: III. The Effects of Viscosity*, 2024, MNRAS, 529, 348
6. **Li, R.** & Lai, D., *Hydrodynamical Evolution of Black-Hole Binaries Embedded in AGN Discs: II. Dependence on Equation of State, Binary Mass, and Separation Scales*, 2023, MNRAS, 522, 1881
5. **Li, R.** & Lai, D., *Hydrodynamical Evolution of Binaries embedded in Accretion Discs*, 2022, MNRAS, 517, 1602
4. **Li, R.**, *Chen, Y.-X., & Lin, D., *Dust Accumulation near the Magnetospheric Truncation of Protoplanetary Discs around T Tauri Stars*, 2022, MNRAS, 510, 5246
3. **Li, R.** & Youdin, A., *Thresholds for Particle Clumping by the Streaming Instability*, 2021, ApJ, 919, 107
2. **Li, R.**, Youdin, A., & Simon, J., *Demographics of Planetesimals Formed by the Streaming Instability*, 2019, ApJ, 855, 69
1. **Li, R.**, Youdin, A. N., & Simon, J. B., *On the Numerical Robustness of the Streaming Instability: Particle Concentration and Gas Dynamics in Protoplanetary Disks*, 2018, ApJ, 862, 14

Second- or third-author, including student-led articles

14. Cui, C., **Li, R.**, Li, Y.-P., Xu Z., & Gerbig, K., *Can Streaming Instability Grow in ALMA Rings?* **2026**, submitted to ApJL
13. Lim, J., Simon, J., **Li, R.**, Carrera, D., Baronett, S., Youdin, A., Lyra, W., & Yang, C.-C., *The Streaming Instability in 3D: Conditions for Strong Clumping*, **2026**, 2026, ApJ, 1000, 156

12. *Kirkeberg, P., **Li, R.**, & Pessah, M., *On the Evolution of Disk Embedded Binaries: Framing Local Models in Global Context*, **2026**, ApJ, 999, 91
11. *Sagynbayeva, S., **Li, R.**, Kuznetsova, A., Zhu, Z., Jiang, Y.-F., & Armitage, P., *Circumplanetary Gas Disks are Rare: A Parameter Survey of Flow Morphology around Giant Planets*, **2025**, ApJ, 987, 216
10. Lim, J., Simon, J., **Li, R.**, Carrera, D., Baronett, S., Youdin, A., Lyra, W., & Yang, C.-C., *Probing Conditions for Strong Clumping by the Streaming Instability: Small Dust Grains and Low Dust-to-gas Ratio*, **2025**, ApJ, 981, 160
9. *Laune, J. T., **Li, R.**, & Lai, D., *Migration of Accreting Planets and Black Holes in Disks*, 2024, ApJ, 975, 296
8. Lim, J., Simon, J., **Li, R.**, Armitage, P., Carrera, D., Rea, D., & Youdin, A., *Streaming Instability and Turbulence: Conditions for Planetesimal Formation*, 2024, ApJ, 969, 130L
7. *Gerbig K. & **Li, R.**, *Planetesimal Initial Mass Functions following Diffusion Regulated Gravitational Collapse*, 2023, ApJ, 949, 81
6. Nesvorný, D., **Li, R.**, Simon, J., Youdin, A., Richardson, D., Marschall, R., & Grundy, W., *Binary Planetesimal Formation from Gravitationally Collapsing Pebble Clouds*, 2021, PSJ, 2, 27
5. Nesvorný, D., **Li, R.**, Youdin, A., Simon, J., & Grundy, W., *Trans-Neptunian Binaries as Evidence for Planetesimal Formation by the Streaming Instability*, 2019, **Nature Astronomy, 3, 808 (my simulation visualization was also featured on the issue cover)**
4. Carrera, D., Simon, J., **Li, R.**, Kretke, K., & Klahr, H., *Protoplanetary Disk Rings as Sites for Planetesimal Formation*, 2021, AJ, 161, 96
3. Gole, D., Simon, J. B., **Li, R.**, Youdin, A., & Armitage, P., *Turbulence Regulates the Rate of Planetesimal Formation via Gravitational Collapse*, 2020, ApJ, 904, 132
2. Abod, C., Simon, J., **Li, R.**, Armitage, P., Youdin, A., & Kretke, K., *The Mass and Size Distribution of Planetesimals Formed by the Streaming Instability. II. The Effect of the Radial Gas Pressure Gradient*, 2019, ApJ, 883, 192
1. Simon, J., Armitage, P., **Li, R.**, & Youdin, A., *The Initial Mass and Size Distribution of Planetesimals. I. The Role of Self-gravity*, 2016, ApJ, 822, 55

Other co-authored articles

8. Choksi, N., Lithwick, Y., Chiang, E. & **Li, R.**, *Two-Stage Disruption Of Resonant Chains*, **2026**, submitted to MNRAS, arXiv:2604.05035
7. Lin, D., Lim, J., Simon, J., Li, Z.-Y., Carrera, D., Fernández-López, M., Harrison, R., **Li, R.**, Looney, L., Stephens, I., & Yang, H., *Azimuthal Dust Polarization from Aerodynamically Aligned Grains as Evidence for the Streaming Instability in Protoplanetary Disks*, **2026**, ApJ in press
6. Baronett, S., Lyra, W., Aly, H., Brouillette, O., Carrera, D., De Cun, V., Eriksson, L.,

Flock, M., Huang, P., Krapp, L., Lesur, G., **Li, R.**, Li, S., Lim, J., Paardekooper, S.-J., Rea, D., Sengupta, D., Simon, J., Sudarshan, P., Umurhan, O., Yang, C.-C., & Youdin, A., *A Comparative Study of the Streaming Instability: Unstratified Models with Marginally Coupled Grains*, **2026**, submitted to ApJ, arXiv:2603.04558

5. Li, J., Close, L. M., Long, F., Males, J. R., Haffert, S. Y., Weinberger, A., Follette, K., Andrews, S., Carpenter, J., Foster, W. B., Van Gorkom, K., Hedglen, A. D., Herczeg, G. J., Johnson, P. T., Kautz, M. Y., Kueny, J. K., **Li, R.**, Liberman, J., Long, J. D., Lumbres, J., Marino, S., Matrà, L., McEwen, E. A., Guyon, O., Pearce, L. A., Pérez, L. M., Pinilla, P., Schatz, L., Shi, Y., Twitchell, K., Wagner, K., Wilner, D., Wu, Y.-L., Zhang, S., & Zhu, Z., Discovery of Hα Emission from a Protoplanet Candidate around the Young Star 2MASS J16120668-3010270 with MagAO-X, **2025**, ApJL, 990, L70
4. Cui, C., Gerbig, K., Li, Y.-P., Xu, Z., **Li, R.**, Yu, C., Lin, M.-K., & Yuan, F., *Dust Growth in ALMA Rings. II. Dusty Rossby Wave Instability*, **2025**, ApJ, 986, 86
3. Long, F., Pascucci, I., Houge, A., Banzatti, A., Pontoppidan, K., Najita, J., Krijt, S., Xie, C., Williams, J., Herczeg, G., Andrews, S., Bergin, E., Blake, G., Colmenares, M., Harsono, D., Muñoz-Romero, C., **Li, R.**, Lu C., Pinilla P., Wilner D., Vioque M., & Zhang K., *The First JWST View of a 40-Myr-old Protoplanetary Disk: the Late-stage Carbon-rich Phase*, **2025**, ApJL, 978, L30
2. Dai, F., Goldberg, M., Batygin. K., van Saders, J., Chiang, E., Choksi, N., **Li, R.**, Petigura, E., Gilbert, G., Millholland, S., Dai, Y.-Z., Bouma, L., Weiss, L., & Winn, J., *The Prevalence of Resonance Among Young, Close-in Planets*, 2024, AJ, 168, 239
1. Simon, J., Armitage, P., Youdin, A., & **Li, R.**, *Evidence for Universality in the Initial Planetesimal Mass Function*, 2017, ApJL, 847, 12

Published open source softwares in **Astrophysics Source Code Library**

2. `Rubble`: *Simulating Dust Size Distributions in Protoplanetary Disks*, 2021, ascl:2109.011
1. `PLAN`: *A Clump-finder for Planetesimal Formation Simulations*, 2019, ascl:1911.001