Jiaru Li

Center for Interdisciplinary Exploration and Research in Astrophysics

1800 Sherman Ave, Room 8061, Northwestern University, Evanston, IL 60201

jiaru.li@northwestern.edu lijiaru0305.github.io 607-592-8068

Research Interests

Planetary dynamics; hydrodynamics of protoplanetary disks; planet-disk interactions; gravitational wave sources in accretion disks around active galactic nuclei.

Education

Cornell University, Ithaca, NY, USA *Sept. 2017 - May 2023*

- **Ph.D.** in Astronomy and Space Sciences, May 2023
  - **Advisor:** Prof. Dong Lai
  - **Thesis:** Dynamical Evolution of Multi-Orbiter Systems: Applicaiton to Planets, Protoplanetary Disks, and Black Holes
- **M.S.** in Astronomy, Dec 2019

University of Toronto at Scarborough, Toronto, ON, Canada *Sept. 2013 - May 2017*

- **H.B.Sc.** in Physics (Specialist) and Mathematics (Major), May 2017

Experience

CIERA Postdoctoral Fellow *2023 - present*
Center for Interdisciplinary Exploration and Research in Astrophysics, Northwestern University
Supervisor: Prof. Yoram Lithwick

Graduate Research Assistant *2017 - 2023*
Department of Astronomy and Space Sciences, Cornell University
Advisor: Prof. Dong Lai

CSES Graduate Student Fellow *2020 - 2022*
Theoretical Division, Los Alamos National Laboratory
Mentor: Dr. Hui Li

UTEA Undergraduate Research Assistant *2015 - 2017*
Department of Physical and Environmental Sciences, University of Toronto at Scarborough
Supervisor: Prof. Artur Izmaylov

Selected Publications

See the full list on ADS. Papers published in peer-reviewed journals: 12, with 254 citations as of Oct 12, 2024.

First-author Papers

- **Li**, Rodet, & Lai, *Dynamical instability in multi-orbiter systems with gas friction*, 2024, MNRAS, 528, 1198
- **Li** & Lai, *Resonant Excitation of Planetary Eccentricity due to a Dispersing Eccentric Protoplanetary Disk: A New Mechanism of Generating Large Planetary Eccentricities*, 2023, ApJ, 956, 17
- **Li**, Dempsey, Li, Lai, & Li, *Hydrodynamical Simulations of Black Hole Binary Formation in AGN Disks*, 2023, ApJL, 944, L42
- **Li**, Lai, & Rodet, *Long-term Evolution of Tightly Packed Stellar Black Holes in AGN Disks: Formation of Merging Black Hole Binaries via Close Encounters*, 2022, ApJ, 934, 154
- **Li**, Dempsey, Li, & Li, *Ring Formation in Protoplanetary Disks Driven by an Eccentric Instability*, 2021, ApJ, 910, 79
- **Li**, Lai, Anderson, & Pu, *Giant planet scatterings and collisions: hydrodynamics, merger-ejection branching ratio, and properties of the remnants*, 2021, MNRAS, 501, 1621

- **Li** & Lai *Planetary Spin and Obliquity from Mergers*, 2020, ApJL, 898, L20

Other Papers

- Qian, **Li**, & Lai, *Dynamical Friction Models for Black Hole Binary Formation in Active Galactic Nucleus Disks*, 2024, ApJ, 962, 143
- Li, Dempsey, Li, Li, & **Li**, *Hot Circumsingle Disks Drive Binary Black Hole Mergers in Active Galactic Nucleus Disks*, 2022, ApJL, 928, L19
- Li, Dempsey, Li, Li, & **Li**, *Orbital Evolution of Binary Black Holes in Active Galactic Nucleus Disks: A Disk Channel for Binary Black Hole Mergers?*, 2021, ApJ, 911, 124

Selected Honors and Awards

CIERA Postdoctoral Fellowship, Northwestern University *2023*
CSES Student Fellowship, Los Alamos National Laboratory *2020*
New Graduate Student Fellowship, Cornell University *2017*
Governor General's Silver Medal Nomination, University of Toronto *2017*
Samuel Beatty In-Course Scholarship, University of Toronto *2017*
University of Toronto Excellence Award *2016*
Vincent Bladen Scholarship, University of Toronto at Scarborough *2015*
A. D. Allen Memorial Scholarship, University of Toronto at Scarborough *2014*

Selected Presentations

Invited Talks

- 10/2024 - **Seminar:** Theoretical Astrophysics Center Seminar, University of California, Berkeley
- 10/2024 - **Conference:** Transient Phenomena and Physical Processes Around Supermassive Black Holes, Tsung-Dao Lee Institute, China
- 09/2024 - **Seminar:** Department of Astronomy Tea Talk, Indiana University Bloomington
- 08/2024 - **Conference:** New Ideas on the Origin of Black Hole Mergers, Niels Bohr Institute, Denmark
- 03/2024 - **Seminar:** Center for Theory and Computation Seminar, University of Maryland
- 01/2024 - **Seminar:** ET Science Seminar, Shanghai Astronomical Observatory, Chinese Academy of Sciences, China
- 03/2023 - **Conference:** AGN Santa Fe: "Where are the Objects in AGN Disks", Santa Fe, NM
- 11/2022 - **Seminar:** Center for Exoplanets and Habitable Worlds Seminar, Penn State University
- 10/2022 - **Seminar:** Center for Relativistic Astrophysics Seminar, Georgia Tech

Other Recent Talks

- 07/2024 - **Conference:** Emerging Researchers in Exoplanet Science Symposium IX, Cornell University
- 05/2024 - **Conference:** The 55th AAS Division on Dynamical Astronomy Meeting, University of Toronto
- 12/2023 - **Conference:** Exoplanets and Planet Formation Workshop, Beijing, China
- 12/2023 - **Conference:** The 32nd Texas Symposium on Relativistic Astrophysics, Shanghai, China
- 05/2023 - **Conference:** The 54th AAS Division on Dynamical Astronomy Meeting, Michigan State University
- 12/2022 - **Group Meeting:** Planetary Formation Group, CCA, Flatiron Institute
- 11/2022 - **Seminar:** Planet Lunch Seminar, Princeton University
- 10/2022 - **Workshop:** Recent Advances in Supermassive Black Holes, Cornell University
- 08/2022 - **Seminar:** Astrophysics Seminar, Los Alamos National Laboratory
- 05/2021 - **Conference:** Distorted Astrophysical Discs, Kavli Institute for Cosmology, Cambridge, UK

Selected Service

Reviewer for *Monthly Notices of the Royal Astronomical Society* and *Astronomy and Astrophysics.*
Panelist reviewer for *NASA* research program proposals.
Organizer for *Center for Interdisciplinary Exploration and Research in Astrophysics* Journal Clubs.