

Curriculum Vitae: Jiaru Li

Cornell University
Department of Astronomy
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Education

Jun 2023 (est.)	Ph.D., Cornell University (Astronomy)
Dec 2019	M.S., Cornell University (Astronomy)
May 2017	H.B.Sc., University of Toronto at Scarborough (Physics Specialist, Mathematics Major)

Research Experience

- **Secular Interaction between Planets and Protoplanetary disks**
Advisor: Prof. Dong Lai (Cornell University) 2022 - present
- **Dynamical Formation and Evolution of Black Hole Binaries in Active Galactic Nucleus Disks**
Advisor: Dr. Hui Li (Los Alamos National Laboratory) 2020 - present
Collaborators: Dr. Adam M. Dempsey, Dr. Shengtai Li and Dr. Ya-Ping Li
- **Eccentric Protoplanetary Disks: Linear Mode, Hydrodynamics Simulations, and Ring Formation**
Advisor: Dr. Hui Li (Los Alamos National Laboratory) 2020 - present
Collaborators: Dr. Adam M. Dempsey and Dr. Shengtai Li
- **Dynamical Instability in Multi-Orbiter Systems: Mergers, Scatterings, and Binary Formations**
Advisor: Prof. Dong Lai (Cornell University) 2017 - present
Collaborators: Dr. Laetitia Rodet, Dr. Kassandra Anderson and Dr. Bonan Pu
- **Quantum Geometric Phase Effects in Large Molecules**
Advisor: Prof. Artur Izmaylov (University of Toronto) 2015-2017
Collaborator: Dr. Loïc Joubert-Doriol

Selected Honors and Awards

- **Center for Space and Earth Science Student Fellowship**, Los Alamos National Laboratory 2020 - 2022

- **Cornell New Graduate Student Fellowship** 2017
- **Governor General's Silver Medal nomination**, University of Toronto 2017
- **Graduating Prize in the Physical and Environmental Sciences**, University of Toronto at Scarborough 2017
- **Samuel Beatty In-Course Scholarship**, University of Toronto 2017
- **University of Toronto Excellence Award** 2016
- **E-Fund Scholarship**, University of Toronto at Scarborough 2013 - 2016
- **Vincent Bladen Scholarship**, University of Toronto at Scarborough 2015
- **A. D. Allen Memorial Scholarship**, University of Toronto at Scarborough 2014

Selected Teaching Experience

- **Our Solar System**, Teaching Assistant, Cornell 2019
- **From New Worlds to Black Holes**, Teaching Assistant, Cornell 2018
- **Calculus I & II for Math Major**, Teaching Assistant, Toronto 2016 - 2017
- **Linear Algebra II**, Teaching Assistant, Toronto 2016

Selected Presentations

- **Penn State CEHW Seminar** State College, PA Nov 2022
Seminar talk: *"Produce Highly-Eccentric Planets by the Dispersal of Eccentric Disks"*
- **Recent Advances in Supermassive Black Holes** Ithaca, NY Oct 2022
Workshop Talk: *"Eccentric Black Holes Binaries in AGN Disks"*
- **Georgia Tech CRA Seminar** Atlanta, GA Oct 2022
Seminar talk: *"Formation of Black Hole Binaries in AGN disks through Close Encounters"*
- **Los Alamos Astrophysics Seminar** Los Alamos, NM Aug 2022
Seminar talk: *"Formation of Black Hole Binaries in AGN disks through Close Encounters"*
- **AAS Division on Dynamical Astronomy Meeting** New York, NY Apr 2022
Conference Talk: *"Long-term Evolution of Tightly-Packed Stellar Black Holes in AGN Disks: Formation of Merging Black-Hole Binaries via Close Encounters"*
- **Distorted Astrophysical Discs Workshop at KICC** Cambridge, UK May 2021
Conference Poster: *"Ring Formation in Protoplanetary Discs Driven by an Eccentric Instability"*
- **Cornell Astrophysics Seminar** Ithaca, NY Multiple Times
Seminar talks: various different topics

List of All Publications: Jiaru Li

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First Author Publications

1. **Li, J.** and Lai, D. (2022)
Resonant Excitation of Planetary Eccentricity due to a Dispersing Eccentric Protoplanetary Disk: A New Mechanism of Generating Large Planetary Eccentricities
submitted
2. **Li, J.**, Dempsey, A. M., Li, H., Lai, D., and Li, S. (2022)
Hydrodynamical Simulations of Black-Hole Binary Formation in AGN Disks
submitted
3. **Li, J.**, Rodet, L., and Lai, D. (2022)
Dynamical Instability in Multi-Orbiter Systems with Gas Friction
submitted
4. **Li, J.**, Lai, D., and Rodet, L. (2022)
Long-term Evolution of Tightly Packed Stellar Black Holes in AGN Disks: Formation of Merging Black Hole Binaries via Close Encounters
The Astrophysical Journal, Volume 934, Issue 2, id. 154 (12 pp.)
5. **Li, J.**, Dempsey, A. M., Li, H., and Li, S. (2021)
Ring Formation in Protoplanetary Disks Driven by an Eccentric Instability
The Astrophysical Journal, Volume 910, Issue 1, id. 79 (14 pp.)
6. **Li, J.**, Lai, D., Anderson, K., and Pu, B. (2021)
Giant Planet Scatterings and Collisions: Hydrodynamics, Merger-ejection Branching Ratio, and Properties of the Remnants
Monthly Notices of the Royal Astronomical Society, Volume 501, Issue 2, pp. 1621-1632
7. **Li, J.** and Lai, D. (2020)
Planetary Spin and Obliquity from Mergers
The Astrophysical Journal Letters, Volume 898, Issue 1, id. L20 (7 pp.)

8. **Li, J.**, Joubert-Doriol, L., and Izmaylov, A. F. (2017)
Geometric Phase Effects in Excited State Dynamics through a Conical Intersection in Large Molecules: N-dimensional Linear Vibronic Coupling Model Study
The Journal of Chemical Physics, Volume 147, Issue 6, id. 064106

Co-Authored Publications

9. Li, Y.-P., Dempsey, A. M., Li, H., Li, S., and **Li, J.** (2022)
Hot Circumsingle Disks Drive Binary Black Hole Mergers in Active Galactic Nucleus Disks
The Astrophysical Journal Letters, Volume 928, Issue 2, id. L19 (8 pp.)
10. Li, Y.-P., Dempsey, A. M., Li, S., Li, H., and **Li, J.** (2021)
Orbital Evolution of Binary Black Holes in Active Galactic Nucleus Disks: A Disk Channel for Binary Black Hole Mergers?
The Astrophysical Journal, Volume 911, Issue 2, id. 124 (10 pp.)
11. Izmaylov, A. F., **Li, J.**, and Joubert-Doriol, L. (2016)
A Diabatic Definition of Geometric Phase Effects
Journal of Chemical Theory and Computation, Volume 12, pp. 5278-5283