

JIAXUAN LI

PERSONAL INFORMATION

Name:	Jiaxuan Li (李嘉轩)	Address:	012 Peyton Hall, 4 Ivy Lane, Princeton, NJ 08544
Email:	jiaxuanl@princeton.edu	GitHub:	AstroJacobLi
Homepage:	https://jiaxuanli.me/	ORCID:	orcid.org/0000-0001-9592-4190

RESEARCH INTERESTS

- Dwarf galaxies across different environments: satellite galaxies, field dwarfs, ultra-diffuse (puffy) galaxies.
- Low surface brightness astronomy: galaxy outskirts, tidal debris, data reduction, and LSB-specific instrumentation.
- Stellar population: star formation history, surface brightness fluctuation, initial mass function, photo- z .
- Galaxy evolution: quenching, scaling relations, galaxy-halo connection.
- Statistical methods and machine learning in astrophysics.

EDUCATION

Graduate Student , Department of Astrophysical Sciences, Princeton University, U.S.A.	Aug 2021 – Aug 2026
Advisor: Jenny E. Greene	
Thesis: <i>ELVES-Dwarf Survey: Probing Satellite Population of Isolated Dwarf Galaxies in the Local Volume</i>	
MASTER OF ARTS , Department of Astrophysical Sciences, Princeton University, U.S.A.	Aug 2021 – May 2023
BACHELOR OF SCIENCE (highest honor), Department of Astronomy, Peking University, China	Sept 2016 – July 2020
Major: Astrophysics GPA: 3.80/4.00 Rank: 2 / 28	
Advisors: Pieter van Dokkum (Yale) & Luis C. Ho (Peking)	

PUBLICATIONS

Total citations: 419; first-author citations: 106; h-index: 13 [ADS Library](#)

1. **Li J.**, Greene J., Danieli S., Carlsten S. G., Geha M., Jiang F., Tanaka M., [ELVES-DWARF I: Satellites Systems of Eight Isolated Dwarf Galaxies in the Local Volume](#), *ApJ* submitted.
2. **Li J.**, Greene J., Carlsten S., Danieli S., [Hedgehog: An Isolated Quiescent Dwarf Galaxy at 2.4 Mpc](#), *ApJL* 975, L23 (2024).
★ This work is highlighted in *AAS Nova*.
3. **Li J.**, Melchior P., Hahn C., Huang S., [PopSED: Population-Level Inference for Galaxy Properties from Broadband Photometry with Neural Density Estimation](#), *AJ* 167, 16 (2024).
4. **Li J.**, Greene J., Greco J., Beaton R., Danieli S., Goulding A., Huang S., Kado-Fong E., [Beyond Ultra-Diffuse Galaxies II: Environmental Quenching of Mass-Size Outliers Among the Satellites of Milky Way Analogs](#), *ApJ* 955, 2 (2023).
5. **Li J.**, Greene J., Greco J., Huang S., Melchior P., Beaton R., Casey K., Danieli S., Goulding A., Joseph R., Kado-Fong E., Kim J., MacArthur L., [Beyond Ultra-Diffuse Galaxies I: Mass-Size Outliers Among the Satellites of Milky Way Analogs](#), *ApJ* 955, 1 (2023).
6. **Li J.**, Huang S., Leauthaud A., Moustakas J., Danieli S., Greene J., Abraham R., Ardila F., Kado-Fong E., Lokhorst D., Lupton R., Price P., [Reaching for the Edge I: Probing the Outskirts of Massive Galaxies with HSC, DECaLS, SDSS, and Dragonfly](#), *MNRAS* 515, 4 (2022).
7. Cheng S., **Li J.**, Yang E., [Discovery of a Dwarf Planet Candidate in an Extremely Wide Orbit: 2017 OF₂₀₁](#).
★ See the press releases from the [IAS](#) and [Princeton University](#). This work is also highlighted by *New York Times*, *NBC News*, *Reuters*, *Sky & Telescope*, *Discover Magazine*, *Phys.org*, *New Scientist*, and many more.
8. Wei L., Huang S., **Li J.**, et al., [Zangetsu: A Candidate of Isolated, Quiescent, and Backsplash Ultra-Diffuse Galaxy in the COSMOS Field](#), *ApJ* submitted.
9. Pan Y., Greene J. E., Danieli S., **Li J.**, et al., [The Merian Survey: A Statistical Census of Milky Way Analogs and LMC-SMC-Like Satellites](#), *ApJ* submitted.

10. Srinivasaragavan G. P., et al. (including **Li J.**), [EP250108a/SN 2025kg: A Broad-Line Type Ic Supernova Associated with a Fast X-ray Transient Showing Evidence of Extended CSM Interaction](#), *ApJL* accepted.
11. Ma Y., Greene J. E., Setton D. J., Goulding A. D. et al. (including **Li J.**), [Counting Little Red Dots at \$z < 4\$ with Ground-based Surveys and Spectroscopic Follow-up](#), *ApJL* submitted.
12. Zeng Z., Peter A., Du X., Benson A., **Li J.**, Mace C., Yang S., [Diversity and universality: evolution of dwarf galaxies with self-interacting dark matter](#), *PRD* accepted.
13. Dou J., Peng Y., et al. (including **Li J.**), [The HI Reservoir in Central Spiral Galaxies and the Implied Star Formation Process](#), *ApJL*, 973, 1 (2024).
14. Danieli S., et al. (including **Li J.**), [Merian: A Wide-Field Imaging Survey of Dwarf Galaxies at \$z \sim 0.06 - 0.10\$](#) , *ApJ* accepted.
15. Mintz A., Greene J., Kado-Fong E., Danieli S., **Li J.**, et al., [A non-parametric morphological analysis of H \$\alpha\$ emission in bright dwarfs using Merian Survey](#), *ApJ* 974, 2 (2024).
16. Nemer A., Hahn C., **Li J.**, Melchior P., Goodman J., [Constraining Protoplanetary Disk Winds from Forbidden Line Profiles with Simulation-based Inference](#), *ApJ* 965, 157 (2024).
17. Luo Y. et al. (including **Li J.**), [The Merian Survey: Design, Construction, and Characterization of a Filter Set Optimized to find Dwarf Galaxies and Measure their Dark Matter Halo Properties with Weak Lensing](#), *MNRAS* 530, 4 (2024).
18. Greene J., Danieli S., Carlsten S., Beaton R., Jiang F., **Li J.**, [ELVES III: Environmental Quenching by Milky Way-Mass Hosts](#), *ApJ* 949, 94 (2023).
19. Greene J. et al. (including **Li J.**), [The Nature of Low Surface Brightness Galaxies in the Hyper Suprime-Cam Survey](#), *ApJ* 933, 150 (2022).
20. Shi J., Peng Y., et al. (including **Li J.**), [Cold Gas in Massive Galaxies as A Critical Test of Black Hole Feedback Models](#), *ApJ*, 927, 2 (2022).
21. Danieli S., et al. (including **Li J.**), [NGC5846-UDG1: A galaxy formed mostly by star formation in massive, extremely dense clumps of gas](#), *ApJL* 927, 2 (2022).
22. Liu Q., Abraham R., Gilhuly C., van Dokkum P., Martin P. G., **Li J.**, Greco J. P., et al., [A Method To Characterize the Wide-Angle Point Spread Function of Astronomical Images](#), *ApJ* 925, 2 (2022).
23. Keim M. A., van Dokkum P., Danieli S., Lokhorst D., **Li J.**, Shen Z., Abraham R., et al., [Tidal Distortions in NGC1052-DF2 and NGC1052-DF4: Independent Evidence for a Lack of Dark Matter](#), arXiv:2109.09778, *ApJ* submitted.
24. Miller T. B., van Dokkum P., Danieli S., **Li J.**, Abraham R., Conroy C., Gilhuly C., Greco J. P., Liu Q., Lokhorst D., Merritt A., [The Dragonfly Wide Field Survey. II. Accurate Total Luminosities and Colors of Nearby Massive Galaxies and Implications for the Galaxy Stellar Mass Function](#), *ApJ*, 909, 74 (2021).
25. van Dokkum P., Lokhorst D., Danieli S., **Li J.**, Merritt A., Abraham R., Gilhuly C., Greco J. P., [Multi-resolution filtering: an empirical method for isolating faint, extended emission in Dragonfly data and other low resolution images](#), *PASP*, 132, 1013 (2020).
26. Danieli S. et al. (including **Li J.**), [The Dragonfly Wide Field Survey. I. Telescope, Survey Design, and Data Characterization](#), *ApJ*, 894, 2 (2020).

Conference papers, white papers, and code

1. **Li J.**, [smploplib: A Matplotlib template for SuperMongo style](#).
2. **Li J.**, Melchior P., Hahn C., Huang S., [Population-Level Inference for Galaxy Properties from Broadband Photometry](#), accepted to 2023 ICML ML4Astro workshop.
3. Han J. et al. (including **Li J.**), [NANCY: Next-generation All-sky Near-infrared Community surveyY](#), white paper for the Roman Core Community Survey, June 2023.

HONORS AND AWARDS

Charlotte Elizabeth Procter Fellowship, Princeton University	Apr 2025
<i>The fellowship recognizes final-year graduate students for outstanding academic performance and professional promise.</i>	
American Astronomical Society's Chambliss Astronomy Achievement Student Award	Jan 2024
<i>Awarded to the top graduate student posters at the AAS meeting.</i>	
Outstanding Undergraduate Thesis Award in Beijing (北京市本科优秀毕业论文)	Sept 2020
Inaugural PKU Junior Scholar (“未名学士” 称号), Peking University	June 2020
Outstanding Graduate of General Colleges and Universities in Beijing (北京市普通高校优秀毕业生)	June 2020
Outstanding Graduate of Peking University (北京大学优秀毕业生)	June 2020
PKU Scholar in Physics (未名物理学子)	2017 – 2020
Tang Li-Xin Scholarship (10,000 RMB per year, most competitive scholarship in PKU)	May 2019
AEON Scholarship , Peking University (10,000 RMB, 2/202)	Sept 2018
Leo KoGuan Scholarship , Peking University (10,000 RMB, 4/202)	Oct 2017
Lin-bridge Prize for Excellent Undergraduate Research (2,800 RMB, endowed by Prof. Douglas Lin)	Sept 2018
Merit Student , Peking University	2017, 2018
First Prize , 8 th China Undergraduate Physicists Tournament	Aug 2017
Meritorious Winner in Mathematical Contest In Modeling (MCM/ICM)	Apr 2018
Silver Medal , 9 th International Olympiad on Astronomy and Astrophysics (IOAA)	Aug 2015
Gold Medal & Best Result , China National Astronomy Olympiad	2014, 2015
Gold Medal (3rd place) , 1 st Princeton University Physics Competition	Jan 2015

PRESS

- The New York Times: [Scientists Say They've Found a Dwarf Planet Very Far From the Sun](#)
- Reuters: [Possible new dwarf planet spotted near the edge of the solar system](#)
- Sky & Telescope: [Another Dwarf Planet in Our Solar System?](#)
- Institute for Advanced Study: [An Extreme Cousin for Pluto? Possible Dwarf Planet Discovered at Solar System's Edge](#)
- Princeton University: [Princeton Astronomers Discover Extraordinary Distant Object at Solar System's Edge](#)
- AAS Nova: [Discovery of a Lonely Galactic Hedgehog](#)

OBSERVATIONAL PROGRAMS

30 orbits on Hubble Space Telescope, >10 nights on the 6.5 m Magellan telescopes, 3 nights on the 8 m Subaru telescope, ~2 nights on the 8 m Gemini telescope, ~10 nights on the 3.5 m WIYN telescope, plus various other observational programs.

PI:

Hubble Space Telescope Cycle 33: WFC3/UVIS imaging (30 orbits)	2025
Magellan Telescope: 11 dark nights imaging with Baade/IMACS	2024–2025
Magellan Telescope: 1 dark night with Clay/IFUM	2025A
Subaru Telescope: 25 hours dark time imaging with Hyper-Suprime Camera	2025A
Green Bank Telescope: 10.5 hours	2025A
Gemini-North telescope: 18 hours dark time imaging with GMOS	2024B, 2025B
WIYN telescope: 10 dark nights imaging with ODI	2024A, 2024B
Magellan Telescope: 1 dark night spectroscopy with Clay/LDSS3	2022B

Co-I:

Magellan Telescope: 4 dark nights spectroscopy with Baade/MagE	2024–2025
HST Cycle 32: SNAP program for Local Volume Satellite Galaxies	2024
HST Cycle 32: Fulfilling the UV Legacy of the Hubble and Webb Deep Public Frontier Field	2024
Magellan Telescope: 3 dark nights spectroscopy with Clay/IFUM	2023–2024
Merian Survey using the Dark Energy Camera on the Blanco telescope: 12 nights	2021–2024
Shane 3-m Telescope, UCO Lick Observatory: 2 nights observing	2019

SOFTWARE CONTRIBUTIONS

- [smplotlib](#): A Matplotlib template for [SuperMongo](#) style.
It has > 130 stars on GitHub and is used in > 15 [published papers](#).
- [RoSESim](#): Roman semi-resolved galaxy simulator (Li+ in prep)
- [mrf](#): Multi-Resolution Filtering – a method for isolating faint extended emission in Dragonfly data and other low resolution images ([van Dokkum et al. 2020](#))
- More work can be found on my GitHub: [@AstroJacobLi](#)

TEACHING, ADVISING, SERVICE, AND OUTREACH

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|---|-------------|
| • Reviewer for the Astronomical Journal (AJ) | 2023 – now |
| • Course Designer of AST 207 (Observational Astronomy) at Princeton | 2025 Spring |
| • Teaching Assistant of AST 303 (Research Methods in Astrophysics) at Princeton | 2022 Fall |
| • Co-advising Princeton undergraduate students: Sufia Birmingham, Vivek Vijayakumar | |
| • Organizer of the Survey Science Discussion at Princeton | 2022 – now |
| • Organizer of the tea time for Princeton colloquium speakers | 2021 – 2022 |
| • President of Peking University Youth Astronomy Society (largest academic student association at PKU). | |
| • Problem designer for the 2018 International Olympiad on Astronomy and Astrophysics (IOAA) | |
| • Invited to a popular Chinese TV show “Voice” (开讲啦) and talked about astronomy outreach | |

TALKS AND PRESENTATIONS

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| Talk, Near field science with the Roman High Latitude Wide Area Survey, Caltech, California
<i>How to characterize semi-resolved dwarf galaxies in Roman HLWAS</i> | Aug 2025 |
| Talk, KIPAC Tea Talk, Stanford, California
<i>Dwarfs: Near and Far</i> | Aug 2025 |
| Tea Talk, Carnegie Observatories, California
<i>Dwarfs: Near and Far</i> | Aug 2025 |
| Talk, Santa Cruz Galaxy Workshop, Santa Cruz, California
<i>ELVES-Dwarf Survey: Probing Satellite Population of Isolated Dwarf Galaxies in the Local Volume</i> | Aug 2025 |
| Talk, “Galactic Frontiers II: Dwarf Galaxies in the Local Volume and Beyond”, Dartmouth, New Hampshire
<i>ELVES-Dwarf Survey: Probing Satellite Population of Isolated Dwarf Galaxies in the Local Volume</i> | June 2025 |
| Talk, DREAMS collaboration meeting, New York City
<i>ELVES-Dwarf Survey: Probing Satellite Population of Isolated Dwarf Galaxies in the Local Volume</i> | May 2025 |
| Talk, Yale Galaxy Lunch
<i>ELVES-Dwarf Survey: Probing Satellite Population of Isolated Dwarf Galaxies in the Local Volume</i> | May 2025 |
| Talk, Magellan Science Meeting, Washington D.C.
<i>ELVES-Dwarf, Hedgehog, and future SBF surveys</i> | May 2025 |
| Talk at Yale’s Astro × Data Science seminar (<i>invited</i>)
<i>PopSED: Population-level inference for galaxy properties from broadband photometry</i> | Nov 2024 |
| Talk, “Small Galaxies, Cosmic Questions. II”, Durham, UK
<i>ELVES-Dwarf, Hedgehog, and future SBF surveys</i> | Aug 2024 |
| Poster, “Dwarf Galaxies, Star Clusters, and Streams in the LSST Era”, Chicago, Illinois
<i>Hedgehog: An Isolated Quiescent Dwarf Galaxy at 2.4 Mpc</i> | July 2024 |
| Talk, the 243rd meeting of the American Astronomical Society, New Orleans, Louisiana
<i>The Merian Survey: Mapping Classical Dwarf Galaxies at $z = 0.05 - 0.1$ with HSC-SSP + Blanco/DECam</i> | Jan 2024 |

Poster, the 243rd meeting of the American Astronomical Society, New Orleans, Louisiana <i>PopSED: Population-level inference for galaxy properties from broadband photometry</i>	Jan 2024
Talk at Tsinghua DoA ML Session (<i>invited</i>) <i>PopSED: Population-level inference for galaxy properties from broadband photometry</i>	Nov 2023
Poster, Machine Learning for Astrophysics, International Conference on Machine Learning, Hawaii <i>Population-Level Inference for Galaxy Properties from Broadband Photometry</i>	July 2023
Talk, “Galactic Frontiers: Dwarf Galaxies in the Local Volume and Beyond”, New York City <i>Ultra-puffy galaxies among satellites of Milky Way analogs</i>	July 2023
Seminar, Kavli Institute for Astronomy and Astrophysics, Peking University, Beijing <i>Ultra-puffy galaxies among satellites of Milky Way analogs: from definition to environmental quenching</i>	June 2023
Seminar, Department of Astronomy, Tsinghua University, Beijing <i>Ultra-puffy galaxies among satellites of Milky Way analogs: from definition to environmental quenching</i>	June 2023
Poster, Roman Science Inspired by JWST Results, STScI, Baltimore <i>Surface Brightness Fluctuations of Nearby Dwarf Galaxies in the Roman Era</i>	June 2023
Morning Coffee talk about ultra-puffy galaxies, Institute for Advanced Study	Dec 2022
Low surface brightness galaxies and <code>scarlet</code> , Princeton HSC+PFS+Rubin discussion	May 2022