

# JIAXUAN LI

## PERSONAL INFORMATION

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## RESEARCH INTERESTS

- Low surface brightness astrophysics: ultra-diffuse (puffy) galaxies, galaxy outskirts, tidal debris, instrumentation.
- Stellar population: star formation history, semi-resolved galaxies, initial mass function, photo- $z$ .
- Galaxy evolution: quenching, scaling relations, galaxy-halo connection.
- Statistical methods and machine learning in astrophysics: simulation-based inference.

## EDUCATION

<b>Graduate Student</b> , Department of Astrophysical Sciences, Princeton University, U.S.A.	Aug 2021 – Now
• Advisor: Jenny E. Greene	
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	
Thesis: <i>Probing low surface brightness features in the NGC 1052 field with Dragonfly Telephoto Array</i>	
Advisors: Pieter van Dokkum & Luis C. Ho	

## RESEARCH POSITIONS

Research Assistant, KIAA, Peking University, China	Sept 2020 – Aug 2021
Undergraduate Research Intern, Yale University, U.S.	June 2019 – Sept 2019
Undergraduate Research Fellow, University of California, Santa Cruz, U.S.	Oct 2018 – Jan 2019
Undergraduate Research Assistant, Peking University, China	July 2017 – June 2020

## REFERENCES

<b>Prof. Jenny Greene</b>	Princeton University
<b>Prof. Yingjie Peng</b>	Kavli Institute for Astronomy and Astrophysics, Peking University
<b>Prof. Alexie Leauthaud</b>	University of California, Santa Cruz

## PUBLICATIONS

1. **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* accepted.
2. **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* accepted.
3. **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).
4. 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.
5. 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* submitted.

6. Greene J. et al. (including **Li J.**), [ELVES III: Environmental Quenching by Milky Way-Mass Hosts](#), *ApJ* 949, 94 (2023).
7. Greene J. et al. (including **Li J.**), [The Nature of Low Surface Brightness Galaxies in the Hyper Suprime-Cam Survey](#), *ApJ* 933, 150 (2022).
8. Shi J., et al. (including **Li J.**), [Cold Gas in Massive Galaxies as A Critical Test of Black Hole Feedback Models](#), *ApJ*, 927, 2 (2022).
9. 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).
10. 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).
11. 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 Matte](#), arXiv:2109.09778, *ApJ* submitted.
12. 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).
13. 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).
14. Danieli S. et al. (including **Li J.**), [The Dragonfly Wide Field Survey. I. Telescope, Survey Design, and Data Characterization](#), *ApJ*, 894, 2 (2020).

## HONORS AND AWARDS

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<a href="#">Outstanding Undergraduate Thesis Award in Beijing</a> (北京市本科优秀毕业论文)	Sept 2020
<a href="#">Weiming Bachelor</a> (“未名学士” 称号)	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
<a href="#">Tang Li-Xin Scholarship</a> (10,000 RMB per year, most competitive scholarship in PKU)	May 2019
<a href="#">AEON Scholarship</a> , Peking University (10,000 RMB, 2/202)	Sept 2018
<a href="#">Leo KoGuan Scholarship</a> , Peking University (10,000 RMB, 4/202)	Oct 2017
<a href="#">Lin-bridge Prize</a> for Excellent Undergraduate Research (2,800 RMB, endowed by Prof. Douglas Lin)	Sept 2018
Merit Student, Peking University	2017, 2018
First Prize, 8 <sup>th</sup> China Undergraduate Physicists Tournament	Aug 2017
Meritorious Winner in Mathematical Contest In Modeling (MCM/ICM)	Apr 2018
Silver Medal, 9 <sup>th</sup> International Olympiad on Astronomy and Astrophysics (IOAA)	Aug 2015
Gold Medal & Best Result, China National Astronomy Olympiad	2014, 2015
Gold Medal (3 <sup>rd</sup> place), 1 <sup>st</sup> Princeton University Physics Competition	Jan 2015

## OBSERVATION EXPERIENCE

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Clay/LDSS3 on Magellan telescope: 1 dark night spectroscopy	PI, 2022B
TITLE: Redshift confirmation of Ultra-Diffuse Galaxies hosted by Milky-Way analogs at $0.01 < z < 0.04$	
Clay/IFU-M on Magellan telescope: 1 dark night spectroscopy	Co-I, 2023A
TITLE: Spatially Resolved Stellar Populations of Nearby Ultra-Diffuse Galaxies hosted by Milky-Way analogs (PI: Meng Gu)	
<a href="#">Merian Survey</a> with 4-m Blanco telescope and DECam: 12 nights	2021-2023
Shane 3-m Telescope, UCO Lick Observatory: 2 nights observation of spectroscopy.	Jan 2019
Xinglong 2.16-m Telescope (NAOC): 2 nights observation of photometry.	Oct 2019
Peking University 40-cm Telescope (PKUFT): photometry and spectroscopy	2017 – 2019

## COMPUTER SKILLS

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**Skilled in:** Python,  $\text{\LaTeX}$ , Mathematica, Shell/Bash, Git.

**Experienced with:**

- Significant experience with [HSC](#), [DECaLS](#), [Dragonfly](#), [MaNGA](#), [IllustrisTNG](#)
- Manipulating catalogs, analyzing dataset and visualization
- Photometry for galaxies and low surface brightness features
- Probabilistic programming, machine learning, neural network.

**Software Contributions:**

- [smploplib](#): Matplotlib template for SuperMongo style (> 70 stars)
- [mrf](#): Multi-Resolution Filtering – a method for isolating faint extended emission in Dragonfly data and other low resolution images
- [kungpao](#): Photometric analysis library for Hyper Suprime-Camera images
- [unagi](#): For searching and downloading data from Hyper Suprime-Camera
- More work can be found on my Github: [@AstroJacobLi](#)

## TEACHING, ADVISING, AND SERVICE EXPERIENCE

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- Reviewer for AJ
- Teaching Assistant of AST 303 (Research Methods in Astrophysics) 2022 Fall
- Co-advised Vivek Vijayakumar (undergraduate student, Princeton) 2022 Summer
- Co-organizer of the [HSC + PFS + Rubin discussion](#) at Princeton 2022 Fall – now
- Co-organizer of the tea time for Princeton graduate students 2021 Fall – 2022 Fall

## OUTREACH EXPERIENCE

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- President of Peking University [Youth Astronomy Society](#) (largest academic student association at PKU).  
I organized and also gave public talks on topics in astrophysics.
- Mentor of the Chinese Astronomy Olympiad National Team, and wrote a [textbook](#) on Astronomy Olympiad. I also helped design the problems of 12<sup>th</sup> IOAA.
- Invited to a television show “Voice” (开讲啦) on CCTV-1 as a youth representative.  
I talked about the public outreach of astronomy in China and the future of Chinese astronomy. [▶](#)

## TALKS AND PRESENTATIONS

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Poster, Machine Learning for Astrophysics, International Conference on Machine Learning, Hawaii	July 2023
<i>Population-Level Inference for Galaxy Properties from Broadband Photometry</i>	
Talk, “Galactic Frontiers: Dwarf Galaxies in the Local Volume and Beyond”, New York City	July 2023
<i>Ultra-puffy galaxies among satellites of Milky Way analogs</i>	
Seminar, Kavli Institute for Astronomy and Astrophysics, Peking University, Beijing	June 2023
<i>Ultra-puffy galaxies among satellites of Milky Way analogs: from definition to environmental quenching</i>	
Seminar, Department of Astronomy, Tsinghua University, Beijing	June 2023
<i>Ultra-puffy galaxies among satellites of Milky Way analogs: from definition to environmental quenching</i>	
Poster, Roman Science Inspired by JWST Results, STScI, Baltimore	June 2023
<i>Surface Brightness Fluctuations of Nearby Dwarf Galaxies in the Roman Era</i>	
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