SIYANG LI

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Baltimore, Maryland, United States

EDUCATION

Johns Hopkins University *2020 - Current*
Doctor of Philosophy in Astronomy & Astrophysics
Thesis Advisor: Professor Adam G. Riess

Johns Hopkins University *2020 - 2023*
Master of Arts in Physics

University of California, Berkeley *2016 - 2020*
Bachelor of Arts, High Honors in Physics, cum laude
Thesis Advisor: Professor George F. Smoot III

FIRST AUTHOR PUBLICATIONS

Siyang Li, Adam G. Riess, Stefano Casertano, Gagandeep S. Anand, Daniel M. Scolnic, Wenlong Yuan, Louise Breuval, Caroline D. Huang. "Reconnaissance with *JWST* of the J-region Asymptotic Giant Branch in Distance Ladder Galaxies: From Irregular Luminosity Functions to Approximation of the Hubble Constant", *The Astrophysical Journal*, 966 20 (April 23, 2024).

Siyang Li, Adam G. Riess, Daniel Scolnic, Gagandeep S. Anand, Jiaxi Wu, Stefano Casertano, Wenlong Yuan, Rachael Beaton, Richard I. Anderson. "Standardized Luminosity of the Tip of the Red Giant Branch utilizing Multiple Fields in NGC 4258 and the CATs Algorithm", *The Astrophysical Journal*, 956 32 (October 5, 2023).

Siyang Li, Stefano Casertano, Adam G. Riess. "A *Gaia* Data Release 3 View on the Tip of the Red Giant Branch Luminosity", *The Astrophysical Journal*, 950 83 (June 13 2023).

Siyang Li, Stefano Casertano, Adam G. Riess. "A Maximum Likelihood Calibration of the Tip of the Red Giant Branch Luminosity from High Latitude Field Giants using *Gaia* Early Data Release 3 Parallaxes", *The Astrophysical Journal*, 939 96 (November 10, 2022).

Siyang Li, Adam G. Riess, Michael P. Busch, Stefano Casertano, Lucas M. Macri, Wenlong Yuan. "A sub-2% Distance to M31 from Photometrically Homogeneous Near-Infrared Cepheid Period-Luminosity Relations Measured with the *Hubble Space Telescope*", *The Astrophysical Journal*, 920 84 (October 18, 2021).

Siyang Li, George F. Smoot III. "Characterization of a high efficiency silicon photomultiplier for millisecond to sub-microsecond astrophysical transient searches", in [*Society of Photo-Optical Instrumentation Engineers (SPIE) Astronomical Telescopes + Instrumentation; X-Ray, Optical, and Infrared Detectors for Astronomy IX*], *SPIE Proceedings 11454*, 1145422 (December 13, 2020).

Siyang Li, George F. Smoot III, Bruce Grossan, Albert Wai Kit Lau, Marzhan Bekbalanova, Mehdi Shafiee, Thorsten Stezelberger. "Program objectives and specifications for the Ultra-Fast Astronomy observatory", in [*8th Applied Optics and Photonics China; Space Optics, Telescopes and Instrumentation*], *SPIE Proceedings 11341*, 113411Y (December 18, 2019).

Siyang Li, George F. Smoot III. "Characterization of a silicon photomultiplier for the Ultra-Fast Astronomy telescope", in [*SPIE Optics + Photonics; UV/Optical/IR Space Telescopes and Instruments: Innovative Technologies and Concepts IX*], *SPIE Proceedings 11115*, 111150A (September 9, 2019).

Siyang Li, Jérôme Maire, Maren Cosens, Shelley A. Wright. "Detector characterization of a near-infrared discrete avalanche photodiode 5x5 array for astrophysical observations", in [*SPIE Defense + Commercial Sensing; Infrared Technology and Applications XLV*], *SPIE Proceedings 11002*, 110022G (May 7, 2019).

CO-AUTHOR PUBLICATIONS

Gagandeep S. Anand, Adam G. Riess, Wenlong Yuan, Rachael Beaton, Stefano Casertano, **Siyang Li**, Dmitry I. Makarov, Lidia N. Makarova, R. Brent Tully, Richard I. Anderson, Louise Breuval, Andrew Dolphin, Igor D. Karachentsev, Lucas M. Macri, Daniel Scolnic. "Tip of the Red Giant Branch Distances with *JWST*: An Absolute Calibration in NGC 4258 and First Applications to Type Ia Supernova Hosts", *The Astrophysical Journal*, 966 89 (April 26, 2024).

Daniel Scolnic, Adam G. Riess, Jiaxi Wu, **Siyang Li**, Gagandeep S. Anand, Rachael Beaton, Stefano Casertano, Richard Anderson, Suhail Dhawan, Xinwei Ke. "CATS: The Hubble Constant from Standardized TRGB and Type Ia Supernova Measurements", *The Astrophysical Journal Letters*, 954 L31 (September 5, 2023).

Louise Breuval, Adam G. Riess, Lucas M. Macri, **Siyang Li**, Wenlong Yuan, Stefano Casertano, Tarini Konchady, Boris Trahin, Meredith J. Durbin, Benjamin F. Williams. "A 1.3% distance to M33 from HST Cepheid photometry", *The Astrophysical Journal*, 951 118 (March 31, 2023).

Jiaxi Wu, Daniel Scolnic, Adam G. Riess, Gagandeep S. Anand, Rachael Beaton, Stefano Casertano, **Siyang Li**. "Comparative Analysis of TRGBs (CATs) from Unsupervised, Multi-Halo-Field Measurements: Contrast is Key", *The Astrophysical Journal*, 954 87 (November 11, 2022).

Albert W. K. Lau, Mehdi Shafiee, George F. Smoot, Bruce Grossan, **Siyang Li**, Zhanat Maksut. "On-sky silicon photomultiplier detector performance measurements for millisecond to sub-microsecond optical source variability studies", *Journal of Astronomical Telescopes, Instruments, and Systems*, 6(4), 046002 (November 27, 2020).

OTHER PUBLICATIONS

Book Chapter: **Siyang Li**, Rachael Beaton. "Tip of the Red Giant Branch", Invited chapter for the edited book *The Hubble Constant Tension* (Eds. E. Di Valentino and D. Brout, Springer Singapore, 2024, DOI: 10.1007/978-981-99-0177-7).

CosmoVerse 2024 White Paper on Cosmic Tensions: J-region Asymptotic Giant Branch. Principle Author: **Siyang Li**, Co-authors: Adam Riess, Stefano Casertano, Greg Sloan, Louise Breuval, Bartek Zgirski, Gagandeep Anand, Richard Anderson, Caroline Huang, Dan Scolnic.

CosmoVerse 2024 White Paper on Cosmic Tensions: Tip of the Red Giant Branch. Principle Author: Richard I. Anderson, Co-authors: Gagandeep S. Anand, Ippocratis Saltas, Giulia de Somma, **Siyang Li**, Vladas Vansevicius, Louise Breuval, Adam Riess.

CosmoVerse 2024 White Paper on Cosmic Tensions: Cepheids. Principle Author: Louise Breuval, Co-authors: Richard I. Anderson, Giulia De Somma, Lluís Galbany, **Siyang Li**, Lucas Macri, Leandros Perivolaropoulos, Adam Riess, and Vladas Vansevicius.

TELESCOPE PROPOSALS

Towards standardization of the J-region Asymptotic Giant Branch: Investigating Asymmetric Luminosity Functions with Carbon Star Spectra
PI, *Apache Point Observatory Astrophysical Research Consortium 3.5-meter Telescope*, 3 half-nights awarded.

A 1% cross-calibration of Cepheids, TRGB, and JAGB in five nearby galaxies with HST
Co-I (PI: L. Breuval), *Hubble Space Telescope*, GO-17520, 33 orbits awarded.

INVITED PRESENTATIONS

"Reconnaissance with *JWST* of the J-region Asymptotic Giant Branch in Distance Ladder Galaxies: From Irregular Luminosity Functions to Approximation of the Hubble Constant", *CosmoVerse Seminar*, Virtual. Oral presentation (May 24, 2024).

"Reconnaissance with *JWST* of the J-region Asymptotic Giant Branch in Distance Ladder Galaxies: From Irregular Luminosity Functions to Approximation of the Hubble Constant", *Space Telescope Science Institute James Webb Space Telescope Science Conversation*, Baltimore, Maryland, United States. Oral presentation (March 18, 2024).

"Calibrating & Standardizing the Tip of the Red Giant Branch with $Gaia$ and the *Hubble Space Telescope*", *International Space Science Institute: The Stellar Path to the H_0 Tension in the Gaia, TESS, LSST and JWST Era Annual Meeting*, Bern, Switzerland. Virtual oral presentation (June 15, 2023).

CONTRIBUTED PRESENTATIONS

"*JWST*, Distance Measurements, and a New Tool, JAGB", *CosmoVerse@Kraków 2024*, Kraków, Poland. Oral presentation (July 9, 2024).

"Reconnaissance with *JWST* of the J-region Asymptotic Giant Branch in Distance Ladder Galaxies: From Irregular Luminosity Functions to Approximation of the Hubble Constant", *The 6th Neighborhood Workshop at Penn State University*, State College, Pennsylvania, United States. Oral presentation (April 25, 2024).

"Reconnaissance with *JWST* of the J-region Asymptotic Giant Branch in Distance Ladder Galaxies: From Irregular Luminosity Functions to Approximation of the Hubble Constant", *Johns Hopkins AstroCoffee*, Baltimore, Maryland, United States. Oral presentation (Feb. 5, 2024).

"RGB/AGB Populations as Standard Candles with *HST* and *JWST*", *American Astronomical Society Meeting 243 Large Scale Structure, Cosmic Distance Scale II*, New Orleans, Louisiana, United States. Oral presentation (Jan. 11, 2024).

"Reconnaissance of the J-region Asymptotic Giant Branch (JAGB) using the *James Webb Space Telescope*", *Johns Hopkins Giant Branch Workshop*, Baltimore, Maryland, United States. Oral presentation (Nov. 16, 2023).

"Standardized Luminosity of the Tip of the Red Giant Branch Utilizing Multiple Fields in NGC 4258 and the CATs Algorithm", *Johns Hopkins Giant Branch Workshop*, Baltimore, Maryland, United States. Oral presentation (Nov. 16, 2023).

"A *Gaia* Data Release 3 View on the Tip of the Red Giant Branch Luminosity", *Statistical Challenges in Modern Astronomy VIII*, State College, Pennsylvania, United States. Poster presentation (June 12 - 16, 2023).

"A *Gaia* Data Release 3 View on the Tip of the Red Giant Branch Luminosity", *The 5th Neighborhood Workshop at Penn State University*, State College, Pennsylvania, United States. Oral presentation (April 6, 2023).

"A *Gaia* Data Release 3 View on the Tip of the Red Giant Branch Luminosity", *American Astronomical Society Meeting 241 Cosmology II*, Seattle, Washington, United States. Oral presentation (January 11, 2023).

"A Maximum Likelihood Calibration of the Tip of the Red Giant Branch Luminosity using Milky Way Field Giants", *iid2022 Workshop: Statistical Methods for Event Data*, Guntersville, Alabama, United States. Oral presentation (November 15, 2022), https://sites.google.com/uah.edu/iid2022/home.

"Calibrating the Tip of the Red Giant Branch in the Era of the *James Webb Space Telescope*", *Johns Hopkins Physics and Astronomy Grad Wine & Cheese Talks*, Johns Hopkins University. Oral presentation (November 4, 2022).

"A Maximum Likelihood Calibration of the TRGB from Field Stars using *Gaia* Early Data Release 3 Parallaxes", *American Astronomical Society Meeting 240 Cosmology III*, Pasadena, California, United States. Oral presentation (June 16, 2022).

"A Maximum Likelihood Determination of the Tip of the Red Giant Branch Zero-point using *Gaia* Early Data Release 3 Parallaxes", *Johns Hopkins Physics and Astronomy Grad Wine & Cheese Talks*, Online due to COVID-19 pandemic. Oral presentation (September 15, 2021).

"Characterization of a high efficiency silicon photomultiplier for millisecond to sub-microsecond astrophysical transient searches", *SPIE Astronomical Telescopes + Instrumentation; X-Ray, Optical, and Infrared Detectors for Astronomy IX (Conference 11454)*, Online due to COVID-19 pandemic. Poster and oral presentations (December 14-18, 2020).

"Characterization of silicon photomultipliers for astrophysical observations", *University of California, Berkeley Summer Undergraduate Research Fellowship Conference*, Berkeley, California, United States. Oral presentation (August 22, 2019).

"Characterization of a silicon photomultiplier for the Ultra-Fast Astronomy telescope", *SPIE Optics + Photonics; UV/Optical/IR Space Telescopes and Instruments: Innovative Technologies and Concepts IX (Conference 11115)*, San Diego, California, United States. Oral presentation (August 11, 2019).

"Program Objectives and Specifications for the Ultra-Fast Astrophysics Observatory", *8th Applied Optics and Photonics China; Space Optics, Telescopes and Instrumentation (Conference 10)*, Beijing, China. Poster presentation (July 8-9, 2019).

"Development of a Single Photon Counting Detector Calibration Facility for the Ultra Fast Astronomy Project", *Exploring the Energetic Universe Conference*, Nur-Sultan, Kazakhstan. Oral presentation (June 20, 2019).

"Detector characterization of a near-infrared discrete avalanche photodiode 5x5 array for astrophysical observations", *SPIE Defense + Commercial Sensing; Infrared Technology and Applications XLV (Conference 11002)*, Baltimore, Maryland, United States. Poster presentation (April 16, 2019).

"Characterization of a Silicon Photomultiplier for the Ultra Fast Astronomy Telescope", *University of California, Berkeley Physics Department Poster Session*, Berkeley, California, United States. Poster presentation (April 5, 2019).

"Probing Cosmic Dawn: A Search for Nanosecond Optical Counterparts to Fast Radio Bursts", *University of California, Berkeley Physics Department Poster Session*, Berkeley, California, United States. Poster presentation (April 6, 2018).

AWARDS AND FELLOWSHIPS

National Science Foundation Graduate Research Fellowship *2022 - Current*
5 year fellowship with three years of full graduate school funding.

University of California, Berkeley Regents' and Chancellor's Scholarship *2016 - 2020*
Awarded to the highest ranked (2%) undergraduates at the University of California, Berkeley based on academic and extracurricular achievements.

Society of Photo-Optical Instrumentation Engineers (SPIE)
Optics and Photonics Education Scholarship *2019*
Awarded "to outstanding individuals for their potential long-range contribution to optics, photonics, or other related fields".

8th Applied Optics and Photonics China Best Poster Award *2019*
Awarded for the best poster at the 8th Applied Optics and Photonics China conference.

Measurement Science Conference Scholarship *2019*
National scholarship awarded to individuals who demonstrate potential and achievements related to measurement science. Recipients also receive full admission to the Measurement Science Conference in Anaheim, California from April 16-19, 2019 (attended).

University of California, Berkeley Summer Undergraduate Research Fellowship *2019*
Awarded to fund student initiated research leading to a senior thesis and/or publication.

University of California, Berkeley Academic Opportunity Fund Grant *2019*
Awarded to fund "opportunities for individuals and student groups to represent and further the University of California, Berkeley's academic prestige and dedication to education".

University of California, Berkeley Regents' & Chancellor's Research Fellowship *2017, 2018*
Awarded to fund student initiated research.

Hong Kong University of Science and Technology (HKUST) *June 2017, Dec. 2017,*
International Research Fellowship *Dec. 2018, June 2019*
Fellowship fully covering airfare, ground transportation, housing, and meals to conduct research at HKUST.

University of California, Berkeley Physics Undergraduate Research Scholarship *2017 - 2020*
Awarded to fund student research in the physics department.

TEACHING ASSISTANTSHIPS

Johns Hopkins AS.171.118 Stars and the Universe: Cosmic Evolution *Spring 2021, 2022*

Johns Hopkins AS.171.102 General Physics: Physical Science Majors II *Fall 2020*

Johns Hopkins AS.173.111 General Physics Laboratory I *Fall 2020*

SERVICE

Journal Referee: *The Astrophyscial Journal Supplement Series* *2024*

OUTREACH

Johns Hopkins Physics Department Mentor *2023 - Current*
Academic and career mentor for a junior student in the Johns Hopkins physics & astronomy department

Program for Advancing the Health Sciences (PATHS) Mentor *2021-2022*
Study habits workshop mentor and one-on-one mentor for a Alexandria City public school student aspiring to pursue a health-related career.

Application Resources for College and Higher-Education (ARCH) Mentor and Panelist *2021*
Scholarship and essay writing panelist and one-on-one mentor for an underprivileged high school student applying to college.

OTHER

Selected to attend the 73rd Lindau Nobel Laureate Meeting (Physics) in Germany (June 30 - July 5, 2024).

Siyang Li, George F. Smoot III, Thorsten Stezelberger. "Silicon Photomultiplier Telescope Camera", U.S. Provisional Patent Ser. No. 62/940,250, filed November 26, 2019.