

Qiuyue Liang

 qyliang.wixsite.com |  qiuyue.liang@ipmu.jp |  +81 070 26452249 | China

EDUCATION

2018 - 2023 Ph.D. of physics at **University of Pennsylvania**
2014 - 2018 Bachelor of Science at **University of Science and Technology of China**

EXPERIENCE

Kavli Institute for the Physics and Mathematics of the Universe Kashiwa, Japan, Postdoctoral Fellow	Sep 2023 - present
Penn Center for Particle Cosmology Philadelphia, USA, Teaching Assistant and Research Assistant	Sep 2018 - 2023
CAS Key Laboratory for Research in Galaxies and Cosmology Hefei, China, Research Assistant	Mar 2017 - Jul 2018
McGill University Montreal, Canada, Summer Research Trainee	Jun 2017 - Sep 2017
Key Lab of Quantum Information, CAS Hefei, China, Research Trainee	Sep 2016 - Jan 2017
University of Queensland Brisbane, Australia, Exchange Student & Winter Research Trainee	Feb 2016 - Jul 2016

AWARDS

Dissertation completion fellowship May 2022
Werner Teutsch Memorial Prize Jul 2019

CONFERENCES AND WORKSHOPS

Invited Talk

The Frontier of Particle Physics: Exploring Muons, Quantum Science and the Cosmos 2025 YITP, Japan, Jun 2025
Frontiers in Field Theory and Phenomenology, JHU/IPMU Workshop Series 2025 IPMU, Japan, May 2025
Workshop on Cosmic Indicators of Dark Matter 2024 Tohoku University, Japan, Oct 2024
the 4th Asian-European-Institutes Workshop for BSM Tsung-Dao Lee Institute (TDLI), China, Oct 2024
Generalized Symmetries and Vertex Operator Algebras Atami Housenkaku, Japan, Oct 2024
Pacific 2024 UC Berkley Gump station Aug 2024
Cosmology, Astrophysics, Theory and Collider Higgs 2024 Dublin Institute Advanced Study May 2024
Envisaging Future Trajectories in Effective Field Theory KIPMU University of Tokyo Mar 2024
Berkeley Week 2024 University of Tokyo Mar 2024
New perspectives on cosmology APCTP Pohang University of Science and Technology Jan 2024
3rd International Joint Workshop on the Standard Model and Beyond" will be held jointly with the "11th KIAS Workshop on Particle Physics and Cosmology Jeju island Nov 2023
The 3rd "Asian-European-Institutes Workshop for BSM" Ikaho Oct 2023

Seminar Talk

Seminar at Carnegie Mellon University Mar 2025
Seminar at Center for Particle Cosmology, University of Pennsylvania Feb 2025
Seminar at particle group, University of Tokyo, Hongo campus Jul 2024
Seminar at Center for Particle Cosmology, University of Pennsylvania May 2024
Amplitudes and Correlators Journal club, Durham university Feb 2024
Beyond Standard model Seminar, KIAS Jan 2024
Joint Seminar in great Tokyo area, KIPMU Nov 2023
Cosmology Seminar, Rice University Jul 2023
KICP, University of Chicago Dec 2022
Joint Tufts/MIT Cosmology Seminar Oct 2022
Particle Astrophysics Seminar at Case Western Reserve University Sep 2022
TianQin Center for Gravitational Physics Jun 2022
Cosmology Journal Club at Ludwig-Maximilians Universitat Minchen May 2022
Institute of Theoretical Physics, Chinese Academy of Science May 2022
Imperial College 3-PAC series Jan 2022
Particle Cosmology Center, University of Science and Technology of China Sep 2021, Nov 2020, May 2019

Contributed talk

Particles vs. New Probes (P vs. NP) 2025 Center for Computational Astrophysics, Mar 2025, New York
27th New Physics Forum University of Tokyo Nov 2024
COSMO'24 YITP University of Kyoto Oct 2024
Gravity and Cosmology 2024 YITP University of Kyoto Feb 2024
Test Gravity 2023 Jan 2023 Vancouver
Phenomenology 2022 Symposium: From Virtual to Real May 2022 Pittsburg
Storming the Gravitational Wave Frontier Mar 2022 Santa Barbara
COSMO'21 Aug 2021 online

Local organization committee

Kashiwa-no-ha Dark Matter and Cosmology Symposium Oct 2024 IPMU

Summer school

The Amplitude Games Jul 2021 online organized by Mainz Institution
TASI 2020 Jun 2020 organized by UC Boulder

TEACHING AND TUTORING

Teaching assistant

PHYS 505 Intro to Cosmology Spring 2023
PHYS 503 General relativity Fall 2022, Fall 2020
PHYS 500 Math Methods Fall 2021
PHYS 016 Energy, oil and global warming Spring 2020

Public Talk

Astro on tap Philadelphia 2022
Grad Ben talk A [competition](#) held online in 2021.

REFeree

Mark Trodden trodden@physics.upenn.edu, tel:215-898-7938
Fay R. and Eugene L. Langberg Professor of Physics, Co-Director of the Penn Center for Particle Cosmology, University of Pennsylvania
Misao Sasaki misao.sasaki@ipmu.jp, tel: +81-75-753-7058
Professor of Physics, Kavli IPMU, University of Tokyo
Tsutomu Yanagida tsutomu.tyanagida@sjtu.edu.cn
Professor of Physics, Kavli IPMU, University of Tokyo

SKILLS

Mathematica C++

PUBLICATIONS

[HLL25] Sungwoo Hong, Sung Mook Lee, and **Qiuyue Liang**. “Gravitational Wave with Domain Wall Dominance”. In: (Apr. 2025). arXiv: [2504.02462](#) [[astro-ph.CO](#)].

- [Jar+25] Santiago Jaraba, Sachiko Kuroyanagi, **Qiuyue Liang**, Meng-Xiang Lin, and Mark Trodden. “First astrometric constraints on parity-violation in the gravitational wave background”. In: (May 2025). arXiv: [2505.18085 \[astro-ph.CO\]](#).
- [LM25] **Qiuyue Liang** and Tom Melia. “Relativistic Fractons and their Dust”. In: (Mar. 2025). arXiv: [2503.14496 \[hep-th\]](#).
- [LPY25] **Qiuyue Liang**, Xavier Ponce Diaz, and Tsutomu T. Yanagida. “Axion Detection Experiments Can Probe Majoron Models”. In: *Phys. Rev. Lett.* 134.15 (2025), p. 151803. arXiv: [2406.19083 \[hep-ph\]](#).
- [LY25] **Qiuyue Liang** and Tsutomu T. Yanagida. “Non-invertible symmetry as an axion-less solution to the strong CP problem”. In: (May 2025). arXiv: [2505.05142 \[hep-ph\]](#).
- [ELF24] Andrew Eberhardt, **Qiuyue Liang**, and Elisa G. M. Ferreira. “de Broglie scale time delays in pulsar networks for ultralight dark matter”. In: (Nov. 2024). arXiv: [2411.18051 \[astro-ph.CO\]](#).
- [Hu+24] Wayne Hu, **Qiuyue Liang**, Meng-Xiang Lin, and Mark Trodden. “Testing gravity with realistic gravitational waveforms in Pulsar Timing Arrays”. In: *JCAP* 12 (2024), p. 054. arXiv: [2408.11774 \[astro-ph.CO\]](#).
- [Lia+24] **Qiuyue Liang**, Meng-Xiang Lin, Mark Trodden, and Sam S. C. Wong. “Probing parity violation in the stochastic gravitational wave background with astrometry”. In: *Phys. Rev. D* 109.8 (2024), p. 083028. arXiv: [2309.16666 \[astro-ph.CO\]](#).
- [LN24] **Qiuyue Liang** and Silvia Nagy. “Convolutional double copy in (anti) de Sitter space”. In: *JHEP* 04 (2024), p. 139. arXiv: [2311.14319 \[hep-th\]](#).
- [LOS24] **Qiuyue Liang**, Ippei Obata, and Misao Sasaki. “Testing gravity with frequency-dependent overlap reduction function in Pulsar Timing Array”. In: *JCAP* 10 (2024), p. 097. arXiv: [2405.11755 \[astro-ph.CO\]](#).
- [LOY24] **Qiuyue Liang**, Risshin Okabe, and Tsutomu T. Yanagida. “Three-zero texture of quark-mass matrices as a solution to the strong CP problem”. In: *Phys. Lett. B* 859 (2024), p. 139123. arXiv: [2408.12146 \[hep-ph\]](#).
- [Car+23] Mariana Carrillo González, **Qiuyue Liang**, Jeremy Sakstein, and Mark Trodden. “Neutrino-Assisted Early Dark Energy is a Natural Resolution of the Hubble Tension”. In: (Feb. 2023). arXiv: [2302.09091 \[astro-ph.CO\]](#).
- [HLT23] Kurt Hinterbichler, **Qiuyue Liang**, and Mark Trodden. “EFT of conformal symmetry breaking”. In: *Phys. Rev. D* 107.6 (2023), p. 065018. arXiv: [2210.01139 \[hep-th\]](#).
- [Lia23] **Qiuyue Liang**. “New Gravitational Interactions in Cosmology — From Effective Field Theory to Observation”. PhD thesis. Pennsylvania U., 2023.
- [LLT23] **Qiuyue Liang**, Meng-Xiang Lin, and Mark Trodden. “A test of gravity with Pulsar Timing Arrays”. In: *JCAP* 11 (2023), p. 042. arXiv: [2304.02640 \[astro-ph.CO\]](#).
- [GLT22] Mariana Carrillo González, **Qiuyue Liang**, and Mark Trodden. “Double copy for massive scalar field theories”. In: *JHEP* 08 (2022), p. 098. arXiv: [2202.00620 \[hep-th\]](#).
- [Car+21] Mariana Carrillo González, **Qiuyue Liang**, Jeremy Sakstein, and Mark Trodden. “Neutrino-Assisted Early Dark Energy: Theory and Cosmology”. In: *JCAP* 04 (2021), p. 063. arXiv: [2011.09895 \[astro-ph.CO\]](#).

- [GLT21] Mariana Carrillo Gonzalez, **Qiuyue Liang**, and Mark Trodden. “Effective field theory for binary cosmic strings”. In: *Phys. Rev. D* 104.4 (2021), p. 043517. arXiv: [2010.15913 \[hep-th\]](#).
- [LT21] **Qiuyue Liang** and Mark Trodden. “Detecting the stochastic gravitational wave background from massive gravity with pulsar timing arrays”. In: *Phys. Rev. D* 104.8 (2021), p. 084052. arXiv: [2108.05344 \[astro-ph.CO\]](#).
- [Jia+19] Jie Jiang, **Qiuyue Liang**, Yi-Fu Cai, Damien A. Easson, and Yang Zhang. “Numerical study of inflationary preheating with arbitrary power-law potential and a realization of curvaton mechanism”. In: *Astrophys. J.* 876.2 (2019), p. 136. arXiv: [1812.08220 \[astro-ph.CO\]](#).
- [LST19] **Qiuyue Liang**, Jeremy Sakstein, and Mark Trodden. “Baryogenesis via gravitational spontaneous symmetry breaking”. In: *Phys. Rev. D* 100.6 (2019), p. 063518. arXiv: [1904.10510 \[hep-ph\]](#).
- [Bra+18] Robert Brandenberger, **Qiuyue Liang**, Rudnei O. Ramos, and Siyi Zhou. “Fluctuations through a Vibrating Bounce”. In: *Phys. Rev. D* 97.4 (2018), p. 043504. arXiv: [1711.08370 \[hep-th\]](#).
- [BFL17] Robert Brandenberger, Guilherme Franzmann, and **Qiuyue Liang**. “Running of the Spectrum of Cosmological Perturbations in String Gas Cosmology”. In: *Phys. Rev. D* 96.12 (2017), p. 123513. arXiv: [1708.06793 \[hep-th\]](#).