

Yongming Liang 梁永明

ICRR Fellow

Institute for Cosmic Ray Research, The University of Tokyo
ymliang@icrr.u-tokyo.ac.jp · ORCID · researchmap



Research interests

Galaxy evolution; the galaxy–IGM connection; quasars and supermassive black holes; protoclusters and large-scale structure; high-redshift galaxies and cosmic reionization.

Appointments

- **2025-10–present · ICRR Fellow**
ICRR, The University of Tokyo
- **2024-10–2025-09 · Project Researcher**
National Astronomical Observatory of Japan
- **2022-10–2024-09 · Project Researcher**
ICRR, The University of Tokyo
- **Jan–Feb 2024 · Visiting Researcher**
University of Milano-Bicocca; host: Sebastiano Cantalupo

Education

- **2017–2022 · Ph.D., SOKENDAI**
Astronomy research based at NAOJ. Thesis: *Correlation between galaxy and IGM H I at $z \approx 2$ mapped by Subaru/HSC*. Supervisors: Nobunari Kashikawa and Masayuki Tanaka.
- **2013–2017 · Bachelor's degree in astronomy**
University of Science and Technology of China. Supervisor: Junxian Wang.

Research funding

- **2024–2027 · Principal Investigator · JSPS KAKENHI 24K17084**
Early-Career Scientists. Elucidating the Trigger and Feedback Mechanisms of the Most Concentrated Quasars at Cosmic Noon. JPY 4,550,000 including indirect costs; JPY 3,500,000 direct.
- **2025–2030 · Co-Investigator · JSPS KAKENHI 25H00663**
Scientific Research (A). Galaxy Overdense Regions in the Distant Universe Revealed by Wide-Area Sky Survey and TAO. PI: Nobunari Kashikawa.
- Chandra Cycle 27 · Science PI · Associated U.S. observing grant
US\$61,320 approved for U.S. investigators. U.S. administrative PI: Martin Elvis (CfA).

Observing time

Telescope time for PI-led projects and collaborations · 2018–2026

Telescope	PI	Co-I / collaborator
Chandra	340 ks	120 ks
Subaru	9 nights	22 nights
Keck	½ night	8 nights
Magellan	1 night	2 nights
Blanco 4-m	7 nights	—
Hubble	—	2 orbits
JWST	—	161 h
Roman	—	1 Analysis program
JCMT	61 h	—
ALMA	30 h	31 h
NOEMA	10 h	—
VLA	—	9 h
MeerKAT	—	20 h
uGMRT	—	39 h

Professional service & membership

- Journal referee: Astronomy & Astrophysics (A&A), The Astrophysical Journal (ApJ), and Nature Astronomy.
- JCMT Time Allocation Committee, September 2023–November 2025.
- International Astronomical Union member, since June 2024.
- Astronomical Society of Japan member, since October 2017.

Papers & preprints

2026

Jul 2026

Preprint

Subaru meets JWST: A Direct Measurement of Ly α Escape Fraction at $z \approx 6.2$ with Dual Narrow-Band Imaging

Shimizu, Shunta et al.

arXiv:2607.08264

[ADS](#) [DOI](#) [arXiv](#)

Jul 2026

JWST COSMOS-3D: Spectroscopic census and luminosity function of [O III] emitters at $6.75 < z < 9.05$ in COSMOS

Meyer, Romain A. et al.

A&A, 712, A16

[ADS](#) [DOI](#) [arXiv](#)

Jun 2026

Preprint

Prime Focus Spectrograph on the Subaru Telescope: Overview of Science Operations

Tanaka, Masayuki et al.

arXiv:2606.14012

[ADS](#) [DOI](#) [arXiv](#)

Jun 2026

Subaru High- z Exploration of Low-Luminosity Quasars (SHELLQs) — XXV. Large-scale environments of low-luminosity quasars at $z \sim 6$ traced by Ly α emitters

Arita, Junya et al.

MNRAS, 549, stig784

[ADS](#) [DOI](#) [arXiv](#)

Apr 2026

Cosmic Himalayas in CROCODILE: Probing the Extreme Quasar Overdensities by Count-in-cells Analysis and Nearest-neighbor Distribution

Kuwayama, Yuto et al.

ApJ, 1001, 172

[ADS](#) [DOI](#) [arXiv](#)

Mar 2026

Preprint

A Python-Based Peeling Framework for Radio Interferometry: Application to uGMRT 650MHz Imaging

Peng, Hao et al.

arXiv:2603.10758

[ADS](#) [DOI](#) [arXiv](#)

Feb 2026

Deeper detection limits in astronomical imaging using self-supervised spatiotemporal denoising

Guo, Yuduo et al.

Science, 392, eady9404

[ADS](#) [DOI](#) [arXiv](#)

2025

Dec 2025

Preprint

Little red dot variability over a century reveals black hole envelope via a giant Einstein cross

Zhang, Zijian et al.

arXiv:2512.05180

[ADS](#) [DOI](#) [arXiv](#)

Jul 2025

RIDEN pilot survey: broad-band selection of candidate quasars with extended Lyman- α nebulae using CLAUDS-HSC-SSP-DUNES² joint data

Shimakawa, Rhythm et al.

MNRAS, 540, 3565–3582

[ADS](#) [DOI](#) [arXiv](#)

Jun 2025

Cosmic Himalayas: The Highest Quasar Density Peak Identified in a 10,000 deg² Sky with Spatial Discrepancies between Galaxies, Quasars, and IGM H I

Liang, Yongming et al.

ApJ, 986, 60

[ADS](#) [DOI](#) [arXiv](#)

Apr 2025

SILVERRUSH. XIV. Ly α Luminosity Functions and Angular Correlation Functions from $\sim 20,000$ Ly α Emitters at $z \sim 2.2\text{--}7.3$ from up to 24 deg^2 HSC-SSP and CHORUS Surveys: Linking the Postreionization Epoch to the Heart of Reionization

Umeda, Hiroya et al.

ApJS, 277, 37

[ADS](#) [DOI](#) [arXiv](#)

Mar 2025

The Physical Origin of Extreme Emission Line Galaxies at High Redshifts: Strong [O III] Emission Lines Produced by Obscured Active Galactic Nuclei

Zhu, Chenghao et al.

ApJ, 982, 27

[ADS](#) [DOI](#) [arXiv](#)

Mar 2025

MAMMOTH-Subaru. IV. Large Scale Structure and Clustering Analysis of Ly α Emitters and Ly α Blobs at $z = 2.2\text{--}2.3$

Zhang, Haibin et al.

ApJ, 981, 70

[ADS](#) [DOI](#) [arXiv](#)

Feb 2025

Predicting Ly α emission from distant galaxies with neural network architecture

Yoshioka, Takehiro et al.

MNRAS, 536, 3386–3400

[ADS](#) [DOI](#) [arXiv](#)

2024

Dec 2024

MAMMOTH-Subaru. II. Diverse Populations of Circumgalactic Ly α Nebulae at Cosmic Noon

Li, Mingyu et al.

ApJS, 275, 27

[ADS](#) [DOI](#) [arXiv](#)

Dec 2024

Mining for Protoclusters at $z \sim 4$ from Photometric Data Sets with Deep Learning

Takeda, Yoshihiro et al.

ApJ, 977, 81

[ADS](#) [DOI](#) [arXiv](#)

Sep 2024

Ly α Imaging around the Hyperluminous Dust-obscured Quasar W2246–0526 at $z = 4.6$

Luo, Yibin et al.

ApJ, 972, 51

[ADS](#) [DOI](#) [arXiv](#)

Jan 2024

MAMMOTH-Subaru. V. Effects of Cosmic Variance on Ly α Luminosity Functions at $z = 2.2$ – 2.3

Ma, Ke et al.

ApJ, 961, 102

[ADS](#) [DOI](#) [arXiv](#)

Jan 2024

MAMMOTH-Subaru. III. Ly α Halo Identified by Stacking ~ 3300 Ly α Emitters at $z = 2.2$ – 2.3

Zhang, Haibin et al.

ApJ, 961, 63

[ADS](#) [DOI](#) [arXiv](#)

2023

Sep 2023

SILVERRUSH. XIII. A Catalog of 20,567 Ly α Emitters at $z = 2$ – 7 Identified in the Full-depth Data of the Subaru/HSC-SSP and CHORUS Surveys

Kikuta, Satoshi et al.

ApJS, 268, 24

[ADS](#) [DOI](#) [arXiv](#)

Sep 2023

Subaru High- z Exploration of Low-luminosity Quasars (SHELLQs). XVIII. The Dark Matter Halo Mass of Quasars at $z \sim 6$

Arita, Junya et al.

ApJ, 954, 210

[ADS](#) [DOI](#) [arXiv](#)

Mar 2023

COSMOS2020: Discovery of a Protocluster of Massive Quiescent Galaxies at $z = 2.77$

Ito, Kei et al.

ApJL, 945, L9

[ADS](#) [DOI](#) [arXiv](#)

2022

Oct 2022

The physical origin for spatially large scatter of IGM opacity at the end of reionization: The IGM Ly α opacity-galaxy density relation

Ishimoto, Rikako et al.

MNRAS, 515, 5914–5926

[ADS](#) [DOI](#) [arXiv](#)

Apr 2022

Third data release of the Hyper Suprime-Cam Subaru Strategic Program

Aihara, Hiroaki et al.

PASJ, 74, 247–272

[ADS](#) [DOI](#) [arXiv](#)

Mar 2022

CHORUS. IV. Mapping the Spatially Inhomogeneous Cosmic Reionization with Subaru HSC

Yoshioka, Takehiro et al.

ApJ, 927, 32

[ADS](#) [DOI](#) [arXiv](#)

Feb 2022

A Wide and Deep Exploration of Radio Galaxies with Subaru HSC (WERGS). VI. Distant Filamentary Structures Pointed Out by High- z Radio Galaxies at $z \sim 4$

Uchiyama, Hisakazu et al.

ApJ, 926, 76

[ADS](#) [DOI](#) [arXiv](#)

2021

Jul 2021

Interrelation of the Environment of Ly α Emitters and Massive Galaxies at $2 < z < 4.5$

Ito, Kei et al.

ApJ, 916, 35

[ADS](#) [DOI](#) [arXiv](#)

Jun 2021

Probing Feedback via IGM tomography and the Ly α Forest with Subaru PFS, TMT/ELT, and JWST

Nagamine, Kentaro et al.

ApJ, 914, 66

[ADS](#) [DOI](#) [arXiv](#)

Apr 2021

SILVERRUSH X: Machine Learning-aided Selection of 9318 LAEs at $z = 2.2, 3.3, 4.9, 5.7, 6.6$, and 7.0 from the HSC SSP and CHORUS Survey Data

Ono, Yoshiaki et al.

ApJ, 911, 78

[ADS](#) [DOI](#) [arXiv](#)

Jan 2021

Evidence for GN-z11 as a luminous galaxy at redshift 10.957

Jiang, Linhua et al.

Nature Astronomy, 5, 256–261

[ADS](#) [DOI](#) [arXiv](#)

Jan 2021

Statistical Correlation between the Distribution of Ly α Emitters and Intergalactic Medium H I at $z \sim 2.2$ Mapped by the Subaru/Hyper Suprime-Cam

Liang, Yongming et al.

ApJ, 907, 3

[ADS](#) [DOI](#) [arXiv](#)

2020

Dec 2020

CHORUS. I. Cosmic HydrOgen Reionization Unveiled with Subaru: Overview

Inoue, Akio K. et al.

PASJ, 72, 101

[ADS](#) [DOI](#) [arXiv](#)

Dec 2020

Faint Quasars Live in the Same Number Density Environments as Lyman Break Galaxies at $z \sim 4$

Uchiyama, Hisakazu et al.

ApJ, 905, 125

[ADS](#) [DOI](#) [arXiv](#)

Nov 2020

Subaru High- z Exploration of Low-luminosity Quasars (SHELLQs). XI. Proximity Zone Analysis for Faint Quasar Spectra at $z \sim 6$

Ishimoto, Rikako et al.

ApJ, 903, 60

[ADS](#) [DOI](#) [arXiv](#)

Aug 2020

The UV Luminosity Function of Protocluster Galaxies at $z \sim 4$: The Bright-end Excess and the Enhanced Star Formation Rate Density

Ito, Kei et al.

ApJ, 899, 5

[ADS](#) [DOI](#) [arXiv](#)

2019

Dec 2019

Second data release of the Hyper Suprime-Cam Subaru Strategic Program

Aihara, Hiroaki et al.

PASJ, 71, 114

[ADS](#) [DOI](#) [arXiv](#)

Jun 2019

The Brightest UV-selected Galaxies in Protoclusters at $z \sim 4$: Ancestors of Brightest Cluster Galaxies?

Ito, Kei et al.

ApJ, 878, 68

[ADS](#) [DOI](#) [arXiv](#)

Jan 2019

Suppression of Low-mass Galaxy Formation around Quasars at $z \sim 2-3$

Uchiyama, Hisakazu et al.

ApJ, 870, 45

[ADS](#) [DOI](#) [arXiv](#)
