Yi Xu (徐弈)

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EDUCATION

Ph.D. Astronomy, The University of Tokyo (expected) — September 2025
Thesis: Demography of Kinematics at the Early Stage of Galaxy Formation Probed by Deep Optical and Near-Infrared Spectroscopy
Advisor: Masami Ouchi

M.S. Astronomy, The University of Tokyo — September 2022

B.A. Astronomy, The University of Science and Technology of China — July 2019

INTERESTS

Galaxy evolution, high-redshift galaxies

FELLOWSHIPS AND AWARDS

JSPS DC2 Fellowship — 2025–
Galaxy-IGM Workshop 2024 1st Prize — 2024

ACCEPTED SCIENTIFIC GRANTS

JSPS Research Grant (USD 6,500/JPY 1000,000) — 2025–
Hayakawa Travel Grant (USD 2,700/ JPY420,000) — 2024
SUPER-IRNET Travel Support (USD 3,900/ JPY600,000) — 2024

OBSERVING EXPERIENCE

Magellan/MagE — 1 night
Subaru/FOCAS–IFU — 3 night
Subaru/SWIMS — 1 night
Subaru/MOIRCS — 1 night
Seimei — 4 night

CONTRIBUTED TALKS AT INTERNATIONAL CONFERENCES

1. "Stellar and AGN Feedback Probed with Outflows in JWST Galaxies at z=3-9: Implications of Frequent Nearly-Spherical Galactic Fountains" Cosmic DAWN at High Latitudes — Sweden 2024
2. "Stellar and AGN Feedback Probed with Outflows in JWST Galaxies at z=3-9: Implications of Frequent Nearly-Spherical Galactic Fountains" ELT Science in Light of JWST — USA 2023
3. "Kinematics of Extremely Metal-Poor Galaxies Explored by IFU Observations" Galaxy Evolution Workshop — Japan 2023
4. "Gas Kinematics in Extremely Metal-Poor Galaxies" France-Japan Galaxy Formation Workshop — Japan 2022
5. "Outflows of Low-Mass Galaxies with $M_* = 10^4 - 10^7$ $\mathrm{M}_\odot$: Unexpectedly Weak Feedback?" Early Galaxy Formation Near and Far — Preparing for a Long Journey with JWST, SAZERAC SIPS — Online 2021

SEMINARS

Caltech, UT Austin, SNS Pisa, Arcetri Observatory, University of Geneva

LIST OF PUBLICATIONS

First-author: 4 papers (42 citations)
All: 23 papers (885 citations)

1. Hiroto Yanagisawa, Masami Ouchi, **Yi Xu**, et al., The Astrophysical Journal, 974, 2, 180, 11 pp. (2024). "Balmer Decrement Anomalies in Galaxies at $z \sim 6$ Found by JWST Observations: Density-bounded Nebulae or Excited H I Clouds?"

2. Chenghao Zhu, Yuichi Harikane, **Yi Xu**, et al., arXiv e-prints, arXiv:2410.12198, pp. (2024). "The Physical Origin of Extreme Emission Line Galaxies at High redshifts: Strong [OIII] Emission Lines Produced by Obscured AGNs"

3. Hiroto Yanagisawa, Masami Ouchi, **Yi Xu**, et al., The Astrophysical Journal, 974, 2, 266, 14 pp. (2024). "Strong He I Emission Lines in High N/O Galaxies at $z \sim 6$ Identified in JWST Spectra: High He/H Abundance Ratios or High Electron Densities?"

4. Hiroya Umeda, Masami Ouchi, **Yi Xu**, et al., The Astrophysical Journal, 971, 2, 124, 16 pp. (2024). "JWST Measurements of Neutral Hydrogen Fractions and Ionized Bubble Sizes at $z = 712$ Obtained with Lyα Damping Wing Absorptions in 27 Bright Continuum Galaxies"

5. Yechi Zhang, Masami Ouchi, **Yi Xu**, et al., The Astrophysical Journal, 970, 1, 19, 12 pp. (2024). "Statistics for Galaxy Outflows at $z \sim 69$ with Imaging and Spectroscopic Signatures Identified with JWST/NIRCam and NIRSpec Data"

6. Yuichi Harikane, Akio K. Inoue, **Yi Xu**, et al., arXiv e-prints, arXiv:2406.18352, pp. (2024). "JWST, ALMA, and Keck Spectroscopic Constraints on the UV Luminosity Functions at $z \sim 7-14$: Clumpiness and Compactness of the Brightest Galaxies in the Early Universe"

7. Minami Nakane, Masami Ouchi, **Yi Xu**, et al., The Astrophysical Journal, 967, 1, 28, 22 pp. (2024). "Lyα Emission at $z = 713$: Clear Evolution of Lyα Equivalent Width Indicating a Late Cosmic Reionization History"

8. Shun Hatano, Masami Ouchi, **Yi Xu**, et al., The Astrophysical Journal, 966, 2, 170, 14 pp. (2024). "EMPRESS. XIV. Strong High-ionization Lines of Young Galaxies at $z = 08$: Ionizing Spectra Consistent with the Intermediate-mass Black Holes with $M_{\rm BH} \sim 10^3 10^6$ M$_\odot$"

9. Yoshiaki Ono, Yuichi Harikane, **Yi Xu**, et al., Publications of the Astronomical Society of Japan, 76, 2, 219, 32 pp. (2024). "Census for the rest-frame optical and UV morphologies of galaxies at $z = 4-10$: First phase of inside-out galaxy formation"

10. **Yi Xu**, et al., The Astrophysical Journal, 976, 1, 142, 12 pp. (2024). "Dynamics of a Galaxy at z > 10 Explored by JWST Integral Field Spectroscopy: Hints of Rotating Disk Suggesting Weak Feedback"

11. **Yi Xu**, et al., The Astrophysical Journal, 961, 1, 49, 15 pp. (2024). "EMPRESS. XII. Statistics on the Dynamics and Gas Mass Fraction of Extremely Metal-poor Galaxies"

12. Yuichi Harikane, Kimihiko Nakajima, **Yi Xu**, et al., The Astrophysical Journal, 960, 1, 56, 22 pp. (2024). "Pure Spectroscopic Constraints on UV Luminosity Functions and Cosmic Star Formation History from 25 Galaxies at $z_{\rm spec} = 8.61-13.20$ Confirmed with JWST/NIRSpec"

13. Yuki Isobe, Masami Ouchi, **Yi Xu**, et al., The Astrophysical Journal, 959, 2, 100, 16 pp. (2023). "JWST Identification of Extremely Low C/N Galaxies with [N/O] $\gtrsim 0.5$ at $z = 6-10$ Evidencing the Early CNO-cycle Enrichment and a Connection with Globular Cluster Formation"

14. Yuichi Harikane, Yechi Zhang, **Yi Xu**, et al., The Astrophysical Journal, 959, 1, 39, 18 pp. (2023). "A JWST/NIRSpec First Census of Broad-line AGNs at $z = 4-7$: Detection of 10 Faint AGNs with $M_{\rm BH} = 10^6-10^8$ M$_\odot$ and Their Host Galaxy Properties"

15. **Yi Xu**, et al., arXiv e-prints, arXiv:2310.06614, pp. (2023). "Stellar and AGN Feedback Probed with Outflows in JWST Galaxies at $z = 3-9$: Implications of Frequent Nearly-Spherical Galactic Fountains"

16. Yuki Isobe, Masami Ouchi, **Yi Xu**, et al., The Astrophysical Journal, 956, 2, 139, 8 pp. (2023). "Redshift Evolution of Electron Density in the Interstellar Medium at $z = 0 - 9$ Uncovered with JWST/NIRSpec Spectra and Line-spread Function Determinations"

17. Moka Nishigaki, Masami Ouchi, **Yi Xu**, et al., The Astrophysical Journal, 952, 1, 11, 17 pp. (2023). "EMPRESS. XI. SDSS and JWST Search for Local and $z = 4 - 5$ Extremely Metal-poor Galaxies (EMPGs): Clustering and Chemical Properties of Local EMPGs"

18. Yuki Isobe, Masami Ouchi, **Yi Xu**, et al., The Astrophysical Journal, 951, 2, 102, 18 pp. (2023). "EMPRESS. IX. Extremely Metal-poor Galaxies are Very Gas-rich Dispersion-dominated Systems: Will the James Webb Space Telescope Witness Gaseous Turbulent High-z Primordial Galaxies?"

19. Shun Hatano, Masami Ouchi, **Yi Xu**, et al., arXiv e-prints, arXiv:2304.03726, pp. (2023). "Active Massive Black Hole Found in the Young Star-Forming Dwarf Galaxy SBS 0335-052E"

20. Akinori Matsumoto, Masami Ouchi, **Yi Xu**, et al., The Astrophysical Journal, 941, 2, 167, 14 pp. (2022). "EMPRESS. VIII. A New Determination of Primordial He Abundance with Extremely Metal-poor Galaxies: A Suggestion of the Lepton Asymmetry and Implications for the Hubble Tension"

21. Kimihiko Nakajima, Masami Ouchi, **Yi Xu**, et al., The Astrophysical Journal Supplement Series, 262, 1, 3, 27 pp. (2022). "EMPRESS. V. Metallicity Diagnostics of Galaxies over $12 + \log(O/H) \approx 6.9 - 8.9$ Established by a Local Galaxy Census: Preparing for JWST Spectroscopy"

22. **Yi Xu**, et al., The Astrophysical Journal, 929, 2, 134, 17 pp. (2022). "EMPRESS. VI. Outflows Investigated in Low-mass Galaxies with $M_* = 10^4 - 10^7$ $\mathrm{M}_\odot$: Weak Feedback in Low-mass Galaxies?"

23. Yuki Isobe, Masami Ouchi, **Yi Xu**, et al., The Astrophysical Journal, 925, 2, 111, 18 pp. (2022). "EMPRESS. IV. Extremely Metal-poor Galaxies Including Very Low-mass Primordial Systems with $M_* = 10^4 - 10^5 M_\odot$ and $2\% - 3\%$ (O/H): High (Fe/O) Suggestive of Metal Enrichment by Hypernovae/Pair-instability Supernovae"