

Hiroya Umeda

PHD STUDENT

The University of Tokyo, 7-3-1 Hongo, Bunkyo, Tokyo 113-0033, Japan

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Education

The University of Tokyo

PHD PHYSICS

- Advisor: Prof. Masami Ouchi

7-3-1 Hongo, Bunkyo, Tokyo
113-0033, Japan
April 2023 - present

The University of Tokyo

MS PHYSICS

- Advisor: Prof. Masami Ouchi
- Thesis Title: Cosmic Reionization History and Sources Probed by Optical Imaging and Spectroscopy with the Subaru Telescope

7-3-1 Hongo, Bunkyo, Tokyo
113-0033, Japan
April 2021 - March 2023

The University of Tokyo

BS PHYSICS

7-3-1 Hongo, Bunkyo, Tokyo
113-0033, Japan
April 2017 - March 2021

Publications

1ST AUTHOR

Summary: 2 Total (1 Published, 1 In-Review; Last Update on June 2023)

Umeda, H., Ouchi M., Nakajima, K., et al., *JWST Measurements of Neutral Hydrogen Fractions and Ionized Bubble Sizes at $z = 7 - 12$ Obtained with Ly α Damping Wing Absorptions in 26 Bright Continuum Galaxies*, [2023arXiv230600487U](https://arxiv.org/abs/2023arXiv230600487U), submitted to ApJ, 2023.

Umeda, H., Ouchi M., Nakajima, K., et al., *EMPRESS. VII. Ionizing Spectrum Shapes of Extremely Metal-Poor Galaxies: Uncovering the Origins of Strong H δ and the Impact on Cosmic Reionization*, [ApJ](https://arxiv.org/abs/2023arXiv230508921K), **930**, 37, 14, 2022.

CO-AUTHOR

Summary: 11 Total (1 Published, 3 Accepted, 7 In-Review; Last Update on June 2023)

Kikuta, S., Ouchi M., Shibuya, T., et al., *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*, [2023arXiv230508921K](https://arxiv.org/abs/2023arXiv230508921K), submitted to ApJS, 2023.

Hatano, S., Ouchi M., Umeda, H., et al., *EMPRESS. XIV. Strong High Ionization Lines of Young Galaxies at $z = 0 - 8$: Ionizing Spectra Consistent with the Intermediate Mass Black Holes with $M_{\text{BH}} \sim 10^3 - 10^6 M_{\odot}$* , [2023arXiv230502189H](https://arxiv.org/abs/2023arXiv230502189H), submitted to ApJ, 2023.

Harikane, Y., Nakajima, K., Ouchi, M., et al., *Pure Spectroscopic Constraints on UV Luminosity Functions and Cosmic Star Formation History From 25 Galaxies at $z_{\text{spec}} = 8.61 - 13.20$ Confirmed with JWST/NIRSpec*, [2023arXiv230406658H](https://arxiv.org/abs/2023arXiv230406658H), submitted to ApJ, 2023.

Hatano, S., Ouchi, M., Nakajima, K., et al., *Active Massive Black Hole Found in the Young Star-Forming Dwarf Galaxy SBS 0335-052E*, [2023arXiv230403726H](https://arxiv.org/abs/2023arXiv230403726H), submitted to Nature, 2023.

Xu, Y., Ouchi, M., Isobe, Y., et al., *EMPRESS. XII. Statistics on the Dynamics and Gas Mass Fraction of Extremely-Metal Poor Galaxies*, [2023arXiv230312467X](https://arxiv.org/abs/2023arXiv230312467X), submitted to ApJ, 2023.

Harikane, Y., Zhang, Y., Nakajima, K., et al., *JWST/NIRSpec First Census of Broad-Line AGNs at $z = 4 - 7$: Detection of 10 Faint AGNs with $M_{\text{BH}} \sim 10^6 - 10^7 M_{\text{sun}}$ and Their Host Galaxy Properties*, [2023arXiv230311946H](https://arxiv.org/abs/2023arXiv230311946H), submitted to ApJ,

2023.

Nakajima, K., Ouchi, M., Isobe, Y., et al., *JWST Census for the Mass-Metallicity Star-Formation Relations at $z = 4 - 10$ with the Self-Consistent Flux Calibration and the Proper Metallicity Calibrators*, [2023arXiv230311946H](#), accepted to ApJS, 2023.

Isobe, Y., Ouchi, M., Nakajima, K., et al., *Redshift Evolution of the Electron Density in the ISM at $z \sim 0 - 9$ Uncovered with JWST/NIRSpec Spectra and Line-Spread Function Determinations*, [2023arXiv230106811I](#), submitted to ApJ, 2023.

Mastumoto, A., Ouchi, M., Nakajima, K., et al., *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*, [ApJ, 941, 167, 14, 2022.](#)

Ono, Y., Harikane, Y., Ouchi, M., et al., *Morphologies of Galaxies at $z \gtrsim 9$ Uncovered by JWST/NIRCam Imaging: Cosmic Size Evolution and an Identification of an Extremely Compact Bright Galaxy at $z \sim 12$* , [2022arXiv220813582O](#), accepted to ApJ, 2022.

Isobe, Y., Ouchi, M., Nakajima, K., et al., *EMPRESS. IX. Extremely Metal-Poor Galaxies are Very Gas-Rich Dispersion-Dominated Systems: Will JWST Witness Gaseous Turbulent High- z Primordial Galaxies?*, [2022arXiv220604709I](#), accepted to ApJ, 2022.

Awards, Fellowships, & Grants

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|------|---|------------|
| 2023 | JSPS Research Fellowship Grant, Japan Society for the Promotion of Science
FoPM Qualification Exam Award of Excellence, The Forefront Physics and Mathematics Program to Drive Transformation, the University of Tokyo | USD 21,500 |
| 2021 | Award of Excellence, Galaxy-IGM Workshop 2021
Research Assistant for FoPM, The Forefront Physics and Mathematics Program to Drive Transformation, the University of Tokyo | |

Presentations

Summary for Talks/Posters: 16 Total (3 Peer-Reviewed Oral, 1 Peer-Reviewed Poster, 12 Others)

CONTRIBUTED ORAL PRESENTATIONS

ELT SCIENCE IN LIGHT OF JWST, Los Angeles, U.S., 2023. [Peer-Reviewed](#).

First Star First Galaxy Workshop, Sapporo, Japan, 2023.

Resolving the Extragalactic Universe with ALMA & JWST, Tokyo, Japan, 2023. [Peer-Reviewed](#).

ASJ Autumn Annual Meeting 2023, Nagoya, Japan, 2023.

21cm Line Mini-Workshop, Nagoya, Japan, 2023.

Galaxy-IGM Workshop 2023, Hamamatsu, Japan, 2023.

Understanding the Epoch of Cosmic Reionization, Sesto, Italy, 2023.

France-Japan Workshop, Tokyo, Japan, 2022.

ASJ Autumn Annual Meeting 2022, Niigata, Japan, 2022.

Galaxy-IGM Workshop 2022, Kushiro, Japan, 2022.

SAZERAC-SIPS “Early Galaxy Formation Near and Far”, Online, 2021, [Peer-Reviewed](#).

Metal-Poor Universe, Online, 2021.

ASJ Autumn Annual Meeting 2021, Online, 2021.

Galaxy-IGM Workshop 2021, Online, 2021.

CONTRIBUTED POSTER PRESENTATIONS

The 52nd Saas-Fee Advanced Course, *Les Diablerets*, Switzerland, 2023.

FoPM International Symposium, *Tokyo*, Japan, 2023.

SEMINARS

Special Astro Seminar, *University of California, Riverside*, December, 2023.

Seminar Talk for Galaxy Group, *University of Arizona in Tucson*, December, 2023.

Seminar Talk, *the University of Texas at Austin*, December, 2023.

Cafe Club, *Laboratoire d'Astrophysique de Marseille*, March, 2023.

Outreach & Professional Development _____

SERVICE AND OUTREACH

2024	54th Summer School on Astronomy and Astrophysics , Abstract Committee (Chair)	<i>the University of Tokyo</i>
2024	ICRR Spring School , Tutor	<i>the University of Tokyo</i>
2023	53th Summer School on Astronomy and Astrophysics , Galaxy/Galaxy Cluster Branch (Chair)	<i>the University of Tokyo</i>
2022	ICRR Spring School , Tutor	<i>the University of Tokyo</i>
2021-2023	ICRR Open Campus , Staff	<i>the University of Tokyo</i>
2021-2023	Norikura Summer School (Outreach Club) , Principal	<i>the University of Tokyo</i>

PEER REVIEW

Refereed a journal paper for A&A once

Refereed a journal paper for ApJ once