Yuzo Ishikawa

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MIT Kavli Institute for Astrophysics and Space Research

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APPOINTMENTS

Postdoctoral Associate, MIT Kavli Institute for Astrophysics and Space Research | 2024 - present

EDUCATION

Ph.D. Astronomy and Astrophysics, Johns Hopkins University | 2024

- Ph.D. Advisor: Prof. Nadia L. Zakamska
- Dissertation: "Unlocking the Secrets of a Dual Quasar at Cosmic Noon with Spatially Resolved Spectroscopy of JWST and ALMA"

M.Sc. Physics (Astronomy), San Francisco State University | 2019

- M.Sc. Advisor: Prof. Andy Mahdavi
- Thesis: "Broadband photometric analysis of the stellar populations in brightest cluster galaxies of X-ray luminous galaxy clusters"

B.A. Astrophysics and Physics, University of California, Berkeley | 2014

RESEARCH EXPERIENCE

2024 - present: Postdoctoral Associate, Cosmic Dawn Group
MIT Kavli Institute for Astrophysics and Space Research | *Cambridge, MA, USA*
Supervisor: Prof. Anna-Christina Eilers

2019 - 2024: Graduate Research Assistant
Johns Hopkins University | *Baltimore, MD, USA*
Advisor: Prof. Nadia L. Zakamska

- Multiwavelength analyses of quasar feedback, integral field spectroscopy (IFU) analyses
- VODKA Collaboration: PI of a JWST Cycle 1 program (GO-2654) to study dual quasars and their host galaxies at cosmic noon with NIRSpec and MIRI IFU; co-I of Cycle 2 programs
- Q3D Collaboration: JWST Early Release Science (ERS-1335) of powerful quasars using NIRSpec and MIRI IFU; development of `q3dfit`; co-I of Cycle 2 programs
- Spectroscopy of obscured quasars with Gemini/GNIRS and X-ray XMM-Newton and NuSTAR

2020 - 2021: Graduate Research Assistant
Space Telescope Science Institute | *Baltimore, MD, USA*
Advisors: Dr. Massimo Stiavelli and Dr. Takahiro Morishita

- Using archival Hubble data to search for quasars at the Epoch of Reionization
- Imaging and grism spectroscopy analysis; Spectral energy distribution; galaxy luminosity function

2017 - 2019: Graduate Research Assistant
San Francisco State University | *San Francisco, CA, USA*
Advisor: Prof. Andy Mahdavi

- Stellar population analysis of Hubble archival imaging data of galaxy clusters

2015 - 2019: Staff Research Associate II
UC Berkeley, Space Sciences Laboratory | *Berkeley, CA, USA*
Advisors: Dr. Steven R. Gibson and Dr. Jerry Edelstein

- Astronomical instrumentation: designing, measuring, assembling, and testing spectrograph systems for ground-based and space-based observatories.
Projects: Keck Planet Finder (KPF), Dark Energy Spectroscopic Instrument (DESI), Ionospheric Connection Explorer (ICON) Extreme Ultraviolet Spectrograph (EUV)

STUDENT MENTORING

2023 summer: Ronald Garcia (undergraduate) | Johns Hopkins University
Project to study quadruply lensed quasar using analytical and computational approaches

PUBLICATIONS - Selected

1. ***Y. Ishikawa**, et al. "VODKA: Complex molecular gas dynamics in a kpc-separation $z = 2.17$ dual quasar with ALMA." *arXiv*: 2502.05327. (Submitted, 2025)
2. **Y. Ishikawa**, et al. "VODKA-JWST: Synchronized Growth of Two Supermassive Black Holes in a Massive Gas Disk? A 3.8 kpc Separation Dual Quasar at Cosmic Noon with the NIRSpec Integral Field Unit." *ApJ.* (March, 2025)
3. Y-C. Chen, **Y. Ishikawa**, N. L. Zakamska, et al. "VODKA-JWST: A 3.8 kpc Dual Quasar at Cosmic Noon in a Powerful Starburst Galaxy with JWST/MIRI Integral Field Unit." *ApJ.* (June 2024)
4. A. Vayner, N. L. Zakamska, **Y. Ishikawa**, et al. "First results from the JWST Early Release Science Program Q3D: Powerful quasar-driven galactic scale outflow at $z = 3$." *ApJ.* (Jan. 2024)
5. A. Vayner, N. L. Zakamska, **Y. Ishikawa**, et al. "First results from the JWST Early Release Science Program Q3D: Ionization cone, clumpy star formation and shocks in a $z = 3$ extremely red quasar host." *ApJ.* (Sept. 2023)
6. D. Rupke, et al. [including **Y. Ishikawa**], "First Results from the JWST Early Release Science Program Q3D: Benchmark Comparison of Optical and Mid-infrared Tracers of a Dusty, Ionized Red Quasar Wind at $z = 0.435$." *ApJ.* (Aug. 2023)
7. S. Veilleux, et al. [including **Y. Ishikawa**], "First Results from the JWST Early Release Science Program Q3D: The Warm Ionized Gas Outflow in $z \sim 1.6$ Quasar XID 2028 and Its Impact on the Host Galaxy." *ApJ.* (Aug. 2023)
8. **Y. Ishikawa**, B. Wang, N. L. Zakamska, et al. "Infrared spectroscopic confirmation of $z \sim 2$ photometrically selected obscured quasars." *MNRAS.* (June 2023)
9. S. Yue, et al. [including **Y. Ishikawa**], "Discovery and Characterization of Galactic-scale Dual Supermassive Black Holes Across Cosmic Time." *arXiv*: 2306.15527. (June 2023)
10. A. Vayner, et al. [including **Y. Ishikawa**], "Cold mode gas accretion on two galaxy groups at $z \sim 2$." *MNRAS.* (Feb. 2023)

11. D. Wylezalek, et al. [including **Y. Ishikawa**], "First Results from the JWST Early Release Science Program Q3D: Turbulent Times in the Life of a $z \sim 3$ Extremely Red Quasar Revealed by NIRSpec IFU." *ApJ.* (Nov. 2022)

12. **Y. Ishikawa**, T. Morishita, M. Stiavelli, et al. "Unresolved $z \sim 8$ Point Sources and Their Impact on the Bright End of the Galaxy Luminosity Function." *ApJ.* (Sept. 2022)

13. **Y. Ishikawa**, A. Goulding, N. L. Zakamska, et al. "X-ray analysis of SDSS J165202.60+ 172852.4, an obscured quasar with outflows at peak galaxy formation epoch." *MNRAS.* (April 2021)

14. T. Morishita, et al. [including **Y. Ishikawa**], "SuperBoRG: Exploration of Point Sources at $z \sim 8$ in HST Parallel Fields." *ApJ.* (Nov. 2020)

INVITED TALKS, CONFERENCES, & SEMINARS

JWST High-Redshift Meeting | April. 2025
Center for Astrophysics | Harvard & Smithsonian, USA

Unveiling a Universe of Black Holes: The Next Generation of AGN Surveys | April. 2025
Munich Institute for Astro-, Particle and Biophysics, Germany

Institute for Science and Technology Austria - (Seminar) | March. 2025
Vienna, Austria

243rd American Astronomical Society Meeting - (Dissertation Talk) | Jan. 2024
New Orleans, LA, USA

ELT Science in Light of JWST | Dec. 2023
University of California, Los Angeles, CA, USA

The First Year of JWST Science Conference - | Sept. 2023
Space Telescope Science Institute, Baltimore, MD, USA

TELESCOPE PROPOSALS AWARDED (* Science PI)

James Webb Space Telescope, Cycle 4, Co-I
'MILAN - MIRI LRS Program of AGN at Cosmic Noon"

James Webb Space Telescope, Cycle 2, Co-I
"Deep grism spectroscopy of the complex environment around an extremely red quasar within an ultra-massive host at $z = 3$"

James Webb Space Telescope, Cycle 2, Co-I
"A census of high-redshift kpc-scale dual quasars"

Gemini North Observatory, 2022B
"Extreme quasar feedback at the peak of the galaxy formation"

***Atacama Large Millimeter/Submillimeter Array (ALMA)**, Cycle 9, PI
"First look of a close-separation, $z \sim 2$ dual quasar with ALMA"

***James Webb Space Telescope**, Cycle 1, PI
"Kpc-scale dual supermassive black holes and their impact on galaxy formation at cosmic noon"

AWARDS

2024 - AAS Rodger Doxsey Travel Prize | American Astronomical Society

2023 - Kupperman Family Travel Award | Johns Hopkins University

LEADERSHIP EXPERIENCE

2023 - 2024: 2024 Spring Symposium, Local Organizing Committee (LOC) | STScI

2022 - 2024: Galaxy/AGN Journal Club organizer | JHU & STScI

2022 - 2024: Space@Hopkins Space Fellow | JHU with Dr. Charles L. Bennett

2022: JHU CARE (Center for Astrophysics Research Experience) Seminar Series organizer

2020 - 2022: Physics & Astronomy Graduate Student (PAGS) | JHU

2019 - 2024: Kendo Instructor (4-dan) | JHU Kendo Club

TEACHING EXPERIENCE

2019 - 2020: Graduate Teaching Assistant | Johns Hopkins University

- AS.171.310: Introduction to Space, Science, and Technology
- AS.171.205: Introduction to Practical Data Science: Beautiful Data

2016 - 2018: Graduate Teaching Assistant | San Francisco State University

- ASTR 116: Astronomy Laboratory
- ASTR 400/700: Stellar Astrophysics
- PHYS 230: General Physics with Calculus II (Introduction to electricity and magnetism)
- PHYS 232: General Physics with Calculus Laboratory II (Electricity, magnetism, and circuits)
- PHYS 242: General Physics with Calculus Laboratory III (Thermodynamics and optic)

MEDIA COVERAGE & ARTICLES

JHU Hub, "Webb reveals unprecedented glimpse of merging galaxies," Oct. 20, 2022

NASA, "NASA's Webb Uncovers Dense Cosmic Knot in The Early Universe," Oct. 20, 2022

Astronomical Society of Japan, 天文月報, "JWST で二重クエーサーの謎に迫る," March 2022.

PREVIOUS RESEARCH (Astronomical Instrumentation, selected)

1. S. R. Gibson, et al. [including **Y. Ishikawa**], "System design of the Keck Planet Finder," *Proc SPIE* Vol. 13096, (July 2024)
2. A. D. Baker, et al. [including **Y. Ishikawa**], "A UV double pass spectrograph for monitoring stellar activity for the Keck Planet Finder," *Proc SPIE* Vol. 12184, (Aug. 2022)
3. **Y. Ishikawa**, M. M. Sirk, J. Edelstein, P. Jelinsky, D. Brooks, G. Tarle. "Comprehensive measurements of the volume-phase holographic gratings for the Dark Energy Spectroscopic Instrument." *ApJ.* (Oct. 2018)
4. M. M. Sirk, E. Korpela, **Y. Ishikawa**, et al. Design and Performance of the ICON EUV Spectrograph." *Space Sciences Review.* (July 2017)
5. DESI Collaboration, et al. [including **Y. Ishikawa**], "The DESI Experiment Part I: Science, Targeting, and Survey Design." *arXiv*: 1611.0036. (2016)

6. DESI Collaboration, et al. [including **Y. Ishikawa**], "The DESI Experiment Part II: Instrument Design." *arXiv*: 1611.0037. (2016)

7. **Y. Ishikawa**, et al. "Calibration techniques for NASA ICON Extreme Ultraviolet Spectrograph (EUV)." *Proc SPIE* Vol. 9972. (Sept. 2016)

8. C. L. Poppett, J. Edelstein, **Y. Ishikawa**, et al. "Optical fiber termination method for the Dark Energy Spectroscopic Instrument (DESI)." *Proc. SPIE* Vol. 9908. (Aug. 2016)