Yurina Nakazato

Curriculum Vitae (last updated December 2023)

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Research Interests

First stars, Stream Velocity, first galaxies, cosmic reionization, galaxy formation & evolution, cosmological simulations

Education

Apr. 2023 - present	**Ph.D. student, The University of Tokyo**, Japan
Apr. 2021 - Mar. 2023	M.S. in Physics, The University of Tokyo, Japan Thesis: *Formation and evolution of star clusters and galaxies in the early Universe* Advisor: Naoki Yoshida
Apr. 2017 - Mar. 2021	B.S. in Physics, The University of Tokyo, Japan

Fellowships and Awards

Apr. 2023- Mar. 2026	JSR fellowship
Apr. 2023- Mar. 2026	Japan Society for Promotion of Science (JSPS) Research Fellow, DC1
Mar. 2023	The School of Science Encouragement Award
Mar. 2023	The University of Tokyo President's Award
Mar. 2023	The Excellence Award for Qualifying Exam
Oct. 2021- present	The International Graduate Program for Excellence in Earth-Space Science (IGPEES), the University of Tokyo
Aug. 2021	Best Oral Presentation Award at 51th astronomical meeting for young researchers

Grants

Apr. 2023-Mar.2026	Evolution of first galaxies with multi-wavelength observations and numerical simulations, 4.2M JPY (30K USD), JSPS Grant-in-Aid for Early-Career Scientists, No. 23KJ0728
Apr. 2023-Mar.2026	Grand Aid from JSR fellowship, 3M JPY (21K USD), (declined)

Publications

First Author

3. **Y. Nakazato**, N. Yoshida, D. Ceverino, *Simulatioins of high-redshift [OIII] emitters: Chemical evolution and multi-line diagnostics*, 2023, The Astrophysical Journal, 953, 14, 2023
2. **Y. Nakazato**, G. Chiaki, N. Yoshida, et al., *The formation of Supersonically Induced Gas Objects (SIGOs) with H_2 cooling*, Proceedings of International Astronomical Union, Volume 362, 2023

1. **Y. Nakazato**, G. Chiaki, N. Yoshida, et al., *H_2 cooling and gravitational collapse of supersonically Induced gas objects*, The Astrophysical Journal Letters, 927, 1, 2022

Co-Author

7. C. Williams, et al. (incl.**Y. Nakazato**), *The Supersonic Project: Lighting up the faint end of the JWST UV luminosity function*, submitted to ApJL, arxiv:2310.03799
6. D. Tsuna, **Y. Nakazato**, T. Hartwig, *A Photon Burst Clears the Earliest Dusty Galaxies: Modeling Dust in High-redshift Galaxies from ALMA to JWST*, Monthly Notices of the Royal Astronomical Society, 526, 4, 2023
5. W. Lake et al.(incl.**Y. Nakazato**), *The Supersonic Project: Star Formation in Early Star Clusters without Dark Matter*, The Astrophysical Journal Letters 956, 1, 2023
4. T. Hashimoto et al.(incl.**Y. Nakazato**), *Reionization and the ISM/Stellar Origins with JWST and ALMA (RIOJA):The core of the highest redshift galaxy overdensity at $z = 7.88$ confirmed by NIRSpec/JWST*, The Astrophysical Journal Letters, 955, 8, 2023
3. R. Ura, et al.(incl.**Y. Nakazato**), *Detections of [CII] 158 μm and [OIII] 88 μm in a Local Lyman Continuum Emitter, Mrk 54, and Its Implications to High-redshift ALMA Studies*, The Astrophysical Journal, 948, 1, 2023
2. C. Williams, et al.(incl.**Y. Nakazato**), *The Supersonic Project: The eccentricity and rotational support of SIGOs and DM GHOSts*, The Astrophysical Journal, 945, 1, 2023
1. W. Lake, et al.(incl.**Y. Nakazato**), *The Supersonic Project: The Early Evolutionary Path of SIGOs*, The Astrophysical Journal, 943, 2, 2023

Talks at Conferences and Workshops

International conferences

9. *FirstLight simulations: Chemical evolution and bursty star formation history of high-redshift [OIII] emitters*, Resolving the Extragalactic Universe with ALMA & JWST, Waseda Univ., Japan
8. *Simulations of high-redshift [OIII] emitters: Chemical evolution and bursty star formation history*, RESCEU summer School 2023, Nagano Univ., Japan
7. *Simulations of high-redshift [OIII] emitters: Chemical evolution and multi-line diagnostics*, Shedding new light on the first billion years of the Universe, Marseille, France
6. *The formation of star clusters in the early universe through supersonic gas streams*, The 9th East Asian Numerical Astrophysics Meeting (EANAM9), Okinawa, Japan
5. *Effect of streaming motion of baryons relative to dark matter and the formation of star clusters*, Star Formation in Different Environments (SFDE) 2022, Quy Nhon, Vietnam
4. *[OIII] emission lines from high-z galaxies in the Epoch of Reionization*, RESCEU Summer School 2022, online
3. *The formation of gas-rich structure through baryon-dark matter streaming motion*, National Astronomy Meeting (NAM) 2022, online
2. *The formation of gas-rich structure through baryon-dark matter streaming motion*, IAU Symposium 362 The predictive power of computational astrophysics as a discovery tool, online

1. *The formation of Supersonically Induced Gas Objects (SIGOs)*, RESCEU Summer School 2021, online

Domestic conferences

11. *Formation of clumpy galaxies during the Epoch of Reionization in zoom-in simulations*, ASJ (The Astronomical Society of Japan) Autumn Annual Meeting 2023, Nagoya University, Aichi
10. *Zoom-in simulations of high-redshift galaxies & emission line modeling for JWST and ALMA*, Fine-structure lines workshop 2023, Ehime University, Ehime
9. *Emission line calculation of high-redshift galaxies for JWST & ALMA observation*, Astrophysics Workshop for Young Researchers, The University of Tokyo, Tokyo
8. *[OIII] emission line calculation and line diagnostics from high-redshift galaxy simulations*, ASJ (The Astronomical Society of Japan) Spring Meeting 2023, Rikkyo University, Tokyo
7. *[OIII] observations by ALMA and JWST and hig-z galaxy evolution via simulations*, First Stars First Galaxies 2022, Tokushima University, Tokushima
6. *[OIII] emission line ratio in high-z galaxies*, IGM galaxy work shop 2022, Kushiro, Hokkaido
5. *Statistical features of gas dominant objects(SIGOs) in the early universe*, ASJ (The Astronomical Society of Japan) Spring Annual Meeting 2022, online
4. *The formation of Supersonically Induced Gas Objects by Stream Velocity*, First Stars and First Galaxies Symposium 2021, Tokyo
3. *DM deficient cluster formation by stream gas motion relative to dark matter*, ASJ (The Astronomical Society of Japan) Autumn Annual Meeting 2021, online
2. *The formation of Supersonically Induced Gas Objects (SIGOs) with H2 chemistry*, Symposium for Metal Poor Universe 2021, online
1. *Supersonically Induced Gas Objecs via relative velocities between baryon and dark matter*, 51th astronomical meeting for young researchers 2021, online

Seminars

3. *Modeling of Optical emission lines and recent JWST observations*, One-day workshop on galaxies in the era of JWST/ALMA, Aug. 2023, The University of Tokyo
2. *H_2 cooling of gravitational collapse of SIGOs with high-resolution simulations*, Supersonic Project: Collaboration meeting, UCLA, US
1. *Formation and evolution of star clusters and galaxies in the early Universe*, Feb. 2023, UCLA

Coverage in Media

The core of the most distant galaxy protocluster observed by JWST & ALMA based on Hashimoto et al. 2023

- *The Strong Tag Team of the James Webb Space Telescope and ALMA Captures the Core of the Most Distant Galaxy Protocluster*, Kavli IPMU, Tsukuba Univ., Waseda Univ., Nagoya Univ.

Teaching, Advising, & Professional Survice

Teaching

Apr. 2021-Aug. 2021	Teaching Assistant, Fluid Mechanics, the University of Tokyo
Apr. 2019- present	Language Assistant, International Lounge, the University of Tokyo

Advising

Nov. 2022- Feb. 2023	Mitsutaka Usui, Tsukuba University BS astronomy student

Professional Survice

Mar. 2023	Workshop Organizer, Astrophysics Workshop for Young Researchers, Tokyo, Japan

Leadership & Outreach

Jun. 2023	Organizer of Get-Together Event for Women in STEM, the University of Tokyo
Jul. 2022	Public Talk at Women in STEM, School of Science, the University of Tokyo
Dec. 2019	Rikejo Initiative, the Univerisity of Tokyo
Oct. 2019	Invited talk at Dow Chemical Company, Tokyo, Japan

Research & industry experience

Apr. 2024 - Jul. 2024	**Visiting Student at Scuola Normale Superiore di Pisa** - Host researcher is Prof. Andrea Ferrara.
Nov. 2023 - Dec. 2023	**Visiting Student at Universidad Autónoma de Madrid** - Host researcher is Dr. Daniel Ceverino. - Worked on formation and evolution of clumpy galaxies by using FirstLight simulation
Feb. 2023 - Mar. 2023	**Visiting Student at UCLA** - Worked on Supersonic Project [link]
Jun. 2020 - Mar. 2021	**Study and Visit Abroad Program** - Funded by the faculty of science, the University of Tokyo - Online research internship at Naoz lab, UCLA
Dec. 2019 - Jan. 2020	**Online Language Exchange Program - Utokyo & TUM-** - Participated in an online international exchange program with students from Technical University of Munich
Jun. 2019 - Sep. 2019	**UTokyo Global Internship Program** - Funded by DAIKIN, a company leading air conditioning and refrigeration. - Two-month workplace training at DAIKIN Japan and two-week research internship at DAIKIN Europe in Belgium. Business proposal for food loss and integrated solution of air conditioning and refrigeration.
Aug. 2019	**Summer School of Particle Physics and Nuclear Physics** - Funded by the High Energy Accelerator Research Organization. - Experiment of measuring muon decay time and observing Lamor Precession and Single-Spin Asymmetries. Made the final presentation and poster session.
Aug. 2019	**Nanotechnology Platform Student Training Program**

- Funded by National Institute for Materials Science.
- Five-day research program at Spring-8, the world's largest third-generation synchrotron radiation facility. Conducted X-ray photo-electron spectroscopy (XPS) experiments and data analysis. Made a presentation at the University of Tokyo in September.

Feb. 2019- Mar. 2019 **Undergraduate Research Assistant, TOMODACHI STEM Program**

- Funded by U.S.-Japan Council.
- Five-week science & engineering research internship at Gerts lab, Rice University, Houston. Researched and analyzed the heavy iron collision data of STAR experiment conducted at BNL.
- Final week study tour to Washington, DC including site visits to the Society for the Promotion of Science, JAXA, U.S.-Japan Council, and Women in STEM Workshop at Leihigh University.

Jul. 2014- Aug. 2014 **Okinawa Global Leaders Program**

- Funded by Okinawa Prefectural Board of Education.
- Three-week program to introduce students to key concepts in inter-cultural communication and global leadership.