

Yuri Oku

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Current position

Postdoctoral Research Associate, Center for Cosmology and Computational Astrophysics (C₃A), Institute for Advanced Study in Physics, Zhejiang University

Areas of specialisation

Galaxy Formation and Evolution; ISM; Supernova; AGN; Numerical Simulation

Appointments held

2021-2024 JSPS Research Fellow DC1, Osaka University

Education

2024 **PhD in Physics, Osaka University**
Thesis: *Physically-motivated feedback models and the IGM metal enrichment in cosmological hydrodynamic simulations*
Supervisor: Kentaro Nagamine

2021 **MSc in Physics, Osaka University**
Thesis: *Constructing a Supernova Feedback Model Based on High-Resolution Simulations*
Supervisor: Kentaro Nagamine

2019 **BLA in Physics, The University of Tokyo**
Thesis: *Phase Separation Simulation of Binary Fluids*
Supervisor: Atsushi Ikeda

Grants, scholarships, honours & awards

2021-2024 **JSPS Research Fellow DC1**
アウトフローから解明する低質量銀河形成 (*Elucidating Low-Mass Galaxy Formation from Galactic Outflow*), research grant 2.2M JPY

2021 **JASSO Scholarship** (student loan)
Exemption from repayment for graduate school students with particularly outstanding academic achievements

2022 **Research Excellence Award of Graduate School of Science 2022**, Osaka University

2021 **Research Excellence Award of Graduate School of Science 2021**, Osaka University

2021 **Best Presentation Award**, Galaxy-IGM workshop (Group work, AGN observation group)

2020 **Best Presentation Award**, Galaxy-IGM workshop (Group work, IGM theory group)

Publications

Yuri Oku's publications – SciX library

REFEREED JOURNAL ARTICLES

- 2025 Nakashima K, Nishizawa AJ, Nagamine K, **Oku Y**, Shimizu I, 2025, "Lyman- α forest power spectrum and its cross-correlation with dark matter haloes in different astrophysical models", *Monthly Notices of the Royal Astronomical Society*, 537, 1343, doi:[10.1093/mnras/staf097](https://doi.org/10.1093/mnras/staf097)
- 2024 **Oku Y**, Nagamine K, 2024, "Osaka Feedback Model. III. Cosmological Simulation CROCODILE", *The Astrophysical Journal*, 975, 183, doi:[10.3847/1538-4357/ad77d3](https://doi.org/10.3847/1538-4357/ad77d3)
- 2024 Matsumoto K, Hirashita H, Nagamine K et al (including **Oku Y** as the 12th author of 12 authors), 2024, "Observational signatures of the dust size evolution in isolated galaxy simulations", *Astronomy and Astrophysics*, 689, A79, doi:[10.1051/0004-6361/202449454](https://doi.org/10.1051/0004-6361/202449454)
- 2024 Sinigaglia F, Kitaura F-S, Nagamine K, **Oku Y**, 2024, "The Negative Baryon Acoustic Oscillation Shift in the Ly α Forest from Cosmological Simulations", *The Astrophysical Journal*, 971, L22, doi:[10.3847/2041-8213/ad66bf](https://doi.org/10.3847/2041-8213/ad66bf)
- 2024 Sinigaglia F, Kitaura F-S, Nagamine K, **Oku Y**, Balaguera-Antolínez A, 2024, "Field-level Lyman- α forest modeling in redshift space via augmented nonlocal Fluctuating Gunn-Peterson Approximation", *Astronomy and Astrophysics*, 682, A21, doi:[10.1051/0004-6361/202346931](https://doi.org/10.1051/0004-6361/202346931)
- 2022 **Oku Y**, Tomida K, Nagamine K, Shimizu I, Cen R, 2022, "Osaka Feedback Model. II. Modeling Supernova Feedback Based on High-resolution Simulations", *The Astrophysical Journal Supplement Series*, 262, 9, doi:[10.3847/1538-4365/ac77ff](https://doi.org/10.3847/1538-4365/ac77ff)

NON-REFEREED JOURNAL ARTICLES

- 2025 Dong C, Wiliardy A, Nagamine K, **Oku Y**, Oh BK, Cen R, 2025, "AGN jet evolution simulation with GADGET4-OSAKA", *arXiv e-prints*, arXiv:2508.21282, doi:[10.48550/arXiv.2508.21282](https://doi.org/10.48550/arXiv.2508.21282)
- 2025 Jung M, Kim J-hoon, Nguyen TH et al (including **Oku Y** as the 12th author of 27 authors), 2025, "The AGORA High-resolution Galaxy Simulations Comparison Project. VIII: Disk Formation and Evolution of Simulated Milky Way Mass Galaxy Progenitors at $1 < z < 5$ ", *arXiv e-prints*, arXiv:2505.05720, doi:[10.48550/arXiv.2505.05720](https://doi.org/10.48550/arXiv.2505.05720)
- 2025 Zhang ZJ, Nagamine K, **Oku Y** et al, 2025, "Probing the cosmic baryon distribution and the impact of AGN feedback with FRBs in CROCODILE simulation", *arXiv e-prints*, arXiv:2503.12741, doi:[10.48550/arXiv.2503.12741](https://doi.org/10.48550/arXiv.2503.12741)
- 2020 Shimizu I, **Oku Y**, Nagamine K, Todoroki K, Yajima H, 2020, "Erratum: Osaka feedback model: isolated disc galaxy simulations", *Monthly Notices of the Royal Astronomical Society*, 494, 598, doi:[10.1093/mnras/staa772](https://doi.org/10.1093/mnras/staa772)
- 2020 **Oku Y**, Takae K, Ikeda A, 2020, "Phase separation kinetics of a symmetric binary mixture of glass-forming liquids", *arXiv e-prints*, arXiv:2004.02103, doi:[10.48550/arXiv.2004.02103](https://doi.org/10.48550/arXiv.2004.02103)

CONFERENCE PROCEEDINGS

- 2023 **Oku Y**, Tomida K, Nagamine K, Shimizu I, Cen R, 2023, "Osaka Feedback Model II: Modeling Supernova Feedback Based on High-Resolution Simulations", *Resolving the Rise and Fall of Star Formation in Galaxies*, 373, 181, doi:[10.1017/S1743921322004860](https://doi.org/10.1017/S1743921322004860)

Presentations

INTERNATIONAL CONFERENCES

- 2024 "IGM Metal Enrichment in CROCODILE" **Oku, Y.**, Nagamine, K., Cosmology and galaxy astrophysics with simulations and machine learning 2024, Flatiron Institute, CCA, 2024/12/09-12 (oral)
- 2024 "IGM Metal Enrichment in CROCODILE Simulation", **Oku, Y.**, AGORA in Asia + 5th Numerical Galaxy Formation Meeting in Korea, Seoul National University (attending remotely), 2024/05/07 (oral)
- 2022 "Osaka Feedback Model II: Modeling Supernova Feedback Based on High-Resolution Simulations", **Oku, Y.**, Tomida, K., Nagamine, K., Shimizu, I., Cen, R., 2022 Santa Cruz Galaxy Workshop, UC Santa Cruz, 2022/08/19 (oral)

- 2022 "Osaka Feedback Model II: Modeling Supernova Feedback Based on High-Resolution Simulations", **Oku, Y.**, Tomida, K., Nagamine, K., Shimizu, I., Cen, R., IAU Symposium 373 "Resolving the Rise and Fall of Star Formation in Galaxies", BEXCO, Busan, Korea, 2022/08/02-11 (oral)
- 2022 "Osaka Feedback Model II: Modeling Supernova Feedback Based on High-Resolution Simulations", **Oku, Y.**, Tomida, K., Nagamine, K., Shimizu, I., Cen, R., Galaxy Evolution Workshop 2021, Online meeting, 2022/02/07-10 (oral)
- 2021 "Osaka Feedback Model II: Modelling supernovae based on high-resolution simulations", **Oku, Y.**, Tomida, K., Nagamine, K., Shimizu, I., Cen, R., 1st KooGiG-Junior Workshop, Online meeting, 2021/11/01-05 (oral)

COLLOQUIUM & SEMINARS

- 2023 Scuola Normale Superiore, Talk at Cosmology Group, "IGM metal enrichment by Supernova and AGN Feedback", Nov 29, 2023
- 2023 University of Milano Bicocca, Astrocoffe, "Supernova and AGN Feedback in Galaxies and IGM", Nov 21, 2023
- 2023 Flatiron Institute, CCA Galaxy Formation group meeting: "Osaka Feedback Model II: Modeling Supernova Feedback Based on High-Resolution Simulations", Mar 24, 2023

6 international conference presentations, 35 domestic conference presentations, and 3 seminars, including listed above

Professional Activities and Services

REFeree OF PROFESSIONAL JOURNALS

The Astrophysical Journal

CONFERENCE SOC/LOC MEMBER

- 2025 LOC, Cosmology and Fast Radio Bursts, Hangzhou, China

Teaching

- 2020 **Teaching Assistant** Structure Formation
- 2020 **Teaching Assistant** Mechanics
- 2020 **Teaching Fellow** Honor seminar (stellar evolution)

Skills

Programming: C/C++, CUDA, Fortran, Julia, MPI, OpenMP, Python

Software: ATHENA++, CAMB, CELIB, CLOUDY, GADGET-2,3,4, GAMER-2, GRACKLE, MUSIC, SPLASH, WVTICS, YT

Last updated: October 20, 2025