

Rion Oh

(she/her)

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Department of Physics, KAIST, Daejeon 34141, Republic of Korea

RESEARCH INTERESTS

Early galaxy formation and evolution, star formation histories, quenching galaxies, dusty star-forming galaxies, galaxy lensing, AGN feedback

EDUCATION

KAIST (Korea Advanced Institute of Science and Technology)

Daejeon, South Korea

B.S. in Physics, Minor in Electrical Engineering, GPA: 3.65/4.0

Expected in summer 2027

Thesis: The Evolutionary Connection Between Dusty Star-Forming and Quiescent Galaxies at $z = 2-6$

University of Washington

Seattle, WA

Exchange Student; Research and coursework in the Department of Astronomy

Winter–Spring 2026

PUBLICATIONS

1. **Oh, R.** et al. *Statistical Detection of Neutral Gas Outflows in $z = 2-5$ Quenching Galaxies with JWST*, (2026, in prep)
2. Khullar, G., ..., **Oh, R.**, ... et al. *LEGGOS I: The JWST LEGGOS Survey*, (2026, in prep)

RESEARCH EXPERIENCE

Undergraduate Research Assistant

2026–Present

University of Washington, Red Galaxies Group, *Advisor: Arianna S Long*

Statistical Detection of Neutral Gas Outflows in $z = 2-5$ Quenching Galaxies with JWST

- Selected a quiescent galaxy sample from JWST NIRSpec using $H\alpha$ EW, spanning $2 \leq z \leq 5$
- Performed SED fitting with Prospector on 3,000+ galaxies via NSF ACCESS to extract stellar continua
- Stacked continuum-subtracted spectra to detect NaID absorption features
- Derived outflow velocities and neutral-gas column densities across galaxy types and redshifts

Undergraduate Research Assistant

2026–Present

University of Washington, Khullar Group, *Advisor: Gourav Khullar*

Clump-by-Clump Neutral Feedback in the Waz Arc

- Using JWST NIRSpec IFU spectra of the Waz Arc to probe neutral gas on sub-galactic scales
- Fitting SED and measuring Na I absorption to identify neutral gas outflow signatures
- Comparing $H\beta$ -bright vs. $H\beta$ -weak (DIG) regions to map neutral and ionized gas structure
- Connecting outflow strength to metallicity, age, and SF/quenching state; designed to extend to LEGGOS

Bachelor's Thesis

2026–Present

KAIST, Observational Cosmology & Astrophysics Laboratory, *Advisor: Junhan Kim*

The Evolutionary Connection Between Dusty Star-Forming and Quiescent Galaxies at $z = 2-6$

- Analyzed star formation histories of 249 galaxies at $2 \leq z \leq 6$ using JWST NIRSpec and NIRCам data
- Performed SED fitting with Prospector to derive stellar mass, dust attenuation, and SFR

- Identified 24 DSFGs using A_V , UVJ, and H α EW, and characterized their dynamical states
- Found $\sim 8\%$ of DSFGs exhibit rapid quenching ($v_{\text{quench}} > 19 \text{ dex/Gyr}$)

Undergraduate Researcher

2025

KAIST, Observational Cosmology & Astrophysics Laboratory, *Advisor: Junhan Kim*

- Modeled hot intracluster gas via joint X-ray and SZ analysis following the CLUMP-3D framework
- Implemented triaxial ellipsoidal models of gas density and pressure projected along the line of sight
- Built interactive visualization tools for triaxial cluster projections
- Performed Bayesian inference via MCMC, fitting a 13-parameter model and exploring posterior space

AWARDS & HONORS

Dean’s List , <i>University of Washington</i>	Winter 2026
Korea–U.S. Advanced Fields Youth Scholar , <i>KIAT & IIE</i> , national selection (200 awardees)	2026
Astra Recon Award (satellite) , Hanwha Aerospace & Systems Space Challenger, top 5 teams	2025
Outstanding Student for Academic Inquiry , <i>KAIST Physics</i> , 2 students (astrophysics)	Fall 2025
2nd Place, Scientific Writing Award (English) , <i>KAIST</i>	2024
Academic Excellence Scholarship , <i>KAIST</i> , merit-based	2024–2027
Institutional Merit Scholarship , <i>KAIST</i> , full-tuition	2023–2027
Science & Technology Talent Scholarship , <i>KAIST</i> , merit-based	2023

PRESENTATION

Extragalactic Astronomy Symposium , <i>University of Washington</i>	Spring 2026
<i>Oral</i> : “Statistical Detection of Neutral Gas Outflows in $z = 2\text{--}5$ Quenching Galaxies with JWST”	
Undergraduate Research Symposium , <i>University of Washington</i>	Spring 2026
<i>Poster</i> : “Statistical Detection of Neutral Gas Outflows in $z = 2\text{--}5$ Quenching Galaxies with JWST”	

RESEARCH TRAINING & PROJECTS

Extragalactic Astronomy and Cosmology Summer School , <i>KIAS</i>	Summer 2025
<ul style="list-style-type: none"> • SIDM cosmological simulations with <i>MUSIC & GIZMO</i>: core fraction analysis as a function of halo mass • Galaxy merger simulations with <i>DICE & GIZMO</i>: dark matter, gas, and stellar dynamics • Radio telescope receiver circuit design; antenna parameter constraints for 21 cm intensity mapping 	
Radio Astronomy Summer School and Radio Telescope User Meeting , <i>KASI</i>	Summer 2025
<ul style="list-style-type: none"> • Construction and operation of a small radio telescope; basic data acquisition and analysis • Site visit to the Korean VLBI Network (KVN) data center; lectures on interferometry • Attended Radio Telescope Users Meeting; lectures on KVN, TRAO, SRAO, JCMT, ALMA, and EAVN 	
Stratospheric Balloon Payload Project , <i>KAIST</i>	2025
<ul style="list-style-type: none"> • Built a radiosonde payload with custom circuitry and sensor integration • Modeled trajectories to predict landing coordinates across two launches 	

OBSERVATION

NYSC 1m Telescope, Deokheung Optical Astronomy Observatory (6 hours) Apr 2025

- Time-series photometry of transits of Kepler-17b; extracted light curves and derived planetary radius, orbital period, and semi-major axis

TEACHING EXPERIENCES

Instructor, Elementary STEM Outreach Program Spring 2025

- Designed and led biweekly hands-on STEM lessons for elementary students

Instructor, Secondary-Level Physics 2024

- Improved a high school student's physics mock exam percentile from 60% to 96%

Tutor, Undergraduate STEM Subjects (General Physics, Calculus, General Chemistry) 2023–2025

- Supported multiple students in General Physics, improving course grades from C to an A range

SERVICES & OUTREACH

Mentor, Program for Deaf Youth 2024–Present

- Weekly STEM instruction for middle and high school students with Deafness
- Academic and career mentoring
- Supervision of educational field trips

Student Council Member, Department of Physics, KAIST 2024–2026

- Spearheaded planning and execution of department festival and major information session

Department Representative, Department of Physics, KAIST 2024

- Oversaw departmental budget (\$2.7K) and planned and executed 7 events

REFERENCES

Prof. Arianna S Long

Department of Astronomy, University of Washington

Email: aslong@uw.edu

Research Advisor

Dr. Gourav Khullar

Department of Astronomy, University of Washington

Email: gkhullar@uw.edu

Research Advisor

Prof. Junhan Kim

Department of Physics, KAIST

Email: junhan@kaist.ac.kr

Research Advisor