

Junehyoung Jeon

junehyoungjeon@utexas.edu

Research Interests	I am interested in how the early Universe and its components such as galaxies and black holes evolved. I approach these problems creating/using theoretical models and hydrodynamical simulations to study early structure formation.		
Education	Doctor of Philosophy in Astronomy	Expected completion 2026	
	Astronomy Department, University of Texas at Austin, Austin, Texas		
	Master of Arts in Astronomy	August 2023	
	Astronomy Department, University of Texas at Austin, Austin, Texas		
	Bachelor of Science in Astrophysics, Minor in Physics	May 2021	
	Barrett Honors College, Arizona State University, Tempe, Arizona		
	Average unweighted GPA: 4.0/4.0		
Publication	Jeon, J. et al. (2025). <i>Little Red Dots and their Progenitors from Direct Collapse Black Holes</i> . arxiv:2508.14155, Submitted to ApJ		
	Jeon, J. et al. (2025). <i>The Emerging Black Hole Mass Function in the High-Redshift Universe</i> . The Astrophysical Journal, Volume 988 , Issue 1, 110.		
	Zhang, S., Liu, B., Bromm, V., Jeon, J. , et al. (2025). <i>How do Massive Primordial Black Holes Impact the Formation of the First Stars and Galaxies?</i> . The Astrophysical Journal, Volume 987 , Issue 2, 185.		
	Taylor, A., Finkelstein, S., Kocevski, D., Jeon, J. , et al. (2025). <i>Broad-Line AGN at $3.5 < z < 6$: The Black Hole Mass Function and a Connection with Little Red Dots</i> . The Astrophysical Journal, Volume 986 , Issue 2, 165.		
	Jeon, J. et al. (2025). <i>Physical Pathways for JWST-Observed Supermassive Black Holes in the Early Universe</i> . The Astrophysical Journal, Volume 979 , Issue 2, 127.		
	Jeon, J. et al. (2023). <i>Observability of Low-Luminosity AGN in the Early Universe with JWST</i> . Monthly Notices of the Royal Astronomical Society, 524 , 176-187		
	Jeon, J. et al. (2022). <i>Maximal X-ray feedback in the pre-reionization Universe</i> . Monthly Notices of the Royal Astronomical Society, 515 , 5568-5575		
Conference Talks and Presentations	<i>Little Red Dots and their Progenitors from Direct Collapse Black Holes</i> ITC Lunch, Harvard Center for Astrophysics September 2025		
	<i>Formation and Evolution of Supermassive Black Holes in the Early Universe</i> MAT talks, MIT Kavli Institute September 2025		
	HEAD Seminar, Harvard Center for Astrophysics September 2025		

Galaxy and AGN Journal Club, Space Telescope Science Institute September 2025

The Emerging Black Hole Mass Function in the High-Redshift Universe
Cosmic Frontier Center Inaugural Conference, Austin, United States May 2025

Physical Pathways for JWST-Observed Supermassive Black Holes in the Early Universe
CRISOL25, Toledo, Spain (remote) May 2025
Probing the Genesis of SMBH, Kashiwa, Japan (remote) November 2024
CCA-CFC Workshop, Austin, United States November 2024
ITC Lunch, Harvard Center for Astrophysics November 2024

Conditions for Efficient Growth of Supermassive Black Holes in the Early Universe
COSPAR 2024, Busan, South Korea July 2024
Massive Black Holes in the First Billion Years, Kinsale, Ireland April 2024

Observability of Low-Luminosity AGN in the Early Universe with JWST.
Black Holes on Broadway, New York City, United States December 2023
Young Astronomers on Galactic Nuclei, Palermo, Italy October 2023

Awards and Honors	Graduate Summer Excellence Award, UT Austin (\$9000)	2025
	Board of Visitors Graduate Student Endowment Fund (\$10000), UT Austin	2023
	Professional Development Award, UT Austin (\$500)	2023
	The College of Liberal Arts and Sciences Dean's Medal, ASU	2021
	Moeur Award, ASU Alumni Association	2021
	New American University Award (\$5000)	2018-2021
	The College of Liberal Arts and Sciences Dean's List, ASU	2018-2021

Teaching	<i>Teaching Assistant</i> , University of Texas at Austin: Astrophysics	Spring 2025
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- Assisted astronomy and physics major upper class students with assignments and projects, helping their understanding of the lecture concepts and applications.
- Prepared and taught introductory python modules designed for students who have no prior experience, introducing them to the basics of coding in astrophysics.

Teaching Assistant, University of Texas at Austin: Practical Introduction to Research
Spring 2024, Fall 2021

- Guided astronomy and physics major students through in-class activities such as coding, writing resume, and making posters, providing them with introductory skills in academia.
- Prepared coding and lecture modules for the students, leading the students to understand the concepts.

<i>Teaching Assistant</i> , University of Texas at Austin: Cosmology	Fall 2022
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- Explained course topics to students after class, helping them individually to grasp lecture concepts that they might not have fully understood.

- Guided students through their homeworks, assisting them in understanding questions and steps to solve various cosmology problems.

Tutor, Arizona State University School of Earth and Space Exploration: Introduction to Astrophysics and Cosmology II Spring 2021

- Participated in the live classes to answer the questions students asked, aiding the instructor in the lectures
- Graded assignments with feedback, helping students better understand the problems and their mistakes
- Created visual figures that demonstrated important topics in cosmology, easing the students' understanding of the topics

Learning Assistant, Arizona State University Physics Department: Science of Musical Instruments, University Physics I Mechanics, University Physics II Electricity and Magnetism Fall 2019 - Spring 2021

- Participated in three physics courses as a sub-instructor
- Aided students during in-class problems, activities and questions regarding homework or exam problems

Research Experiences

Studying galaxies at $z \sim 6$ August 2019 - May 2021
Arizona State University
Dr. Rogier Windhorst

- Modeled 53 galaxies using the CIGALE code for SED modeling and determined 47 with valid models with data from previous papers and also extracted data from SDF K-band to add flux data points to the models
- Analyzed the models to determine the fraction of high escape fraction galaxies around $z = 6$ and concluded on their significance on reionization

JWST Cycle-1 Proposed Program: NIRSpec/IFU Observations of Luminous Galaxies at $5.7 < z < 6.6$ August - October 2020
University of Arizona
Dr. Eiichi Egami

- Worked as a co-investigator and performed realistic simulations of Near Infrared Spectrograph (NIRspec) with the Exposure Time Calculator (ETC) to predict JWST observations of extremely blue galaxies that couldn't be modeled accurately so far
- Created figures showing the model and simulated spectra of the galaxies along with their images to be put in the proposal and improve the case for observing these galaxies

Skills

Programming: Python, C, Fortran, High Performance Computing
Operating systems: Windows, Linux
Software: LaTeX, Mathematica
Languages: English, Korean