

# Intae Jung

Postdoctoral Fellow at the Space Telescope Science Institute

3700 San Martin Drive Baltimore, MD 21218, United States

Email: [ijung@stsci.edu](mailto:ijung@stsci.edu) | Webpage: <https://itjung.github.io>

*Lyman- $\alpha$  Emitter | Reionization | High-Redshift Galaxies | Machine Learning*

## Academic Employment

Postdoctoral Researcher at the Space Telescope Science Institute	08/2022 – Present
JWST Postdoc at NASA's Goddard Space Flight Center (Sponsor: CUA)	09/2019 – 08/2022

## Education

<b>Ph.D. in Astronomy, University of Texas at Austin</b> , Texas, USA	2013 – 2019
Advisor: Prof. Steven L. Finkelstein	
<b>M.S. in Astronomy</b> , Graduate School of <b>Yonsei University</b> , Seoul, South Korea	2010 – 2012
Advisor: Prof. Sukyoung K. Yi	
<b>B.S. in Astronomy and Physics</b> (double major), <b>Yonsei University</b> , Seoul, South Korea	2004 – 2010

## Fellowships, Awards, and Grants

KASI-Arizona Joint Postdoctoral Fellowship, Steward Observatory & KASI, Korea ( <b>4yrs</b> , Declined)	2022
CRESST II Postdoc Fellow for an Independent Science Program at NASA GSFC, MD ( <b>3yrs</b> )	2019 – 2022
NASA/Keck Observing Grant 2021A (\$16,100)	2021 Spring
Chambliss Astronomy Achievement Student Awards, 233rd AAS Meeting, Seattle, WA	01/2019
The NASA Earth and Space Science Fellowship (\$45,000/year, <b>up to 3yrs</b> )	2017 – 2019
University Graduate School Continuing Fellowship, UT Austin, TX, USA (~\$25,000)	2017 – 2018
The Global Internship Program, The National Research Foundation of Korea (~\$21,200)	2011 – 2012
National Science & Technology Scholarship, South Korea (~\$27,100)	2004 – 2009

## Awarded Telescope Time

<b>PI: I. Jung</b> , NASA Keck 2021A: 2 nights of Keck + MOSFIRE	2021 Spring
Title: <i>Probing Inhomogeneity of Reionization with a Deep and Wide Lyman-Alpha Emission Survey at <math>z &gt; 7</math></i>	
<b>PI: I. Jung</b> , Gemini North + GNIRS (6.2 hr)	2021 Spring
Title: <i>Near-infrared Spectroscopy of an Extremely-Large Equivalent-width Lyman-alpha Emitter at <math>z=7.608</math></i>	
<b>PI: I. Jung</b> , HET + LRS2 (~13hr)	2017 Spring
Title: <i>A spectroscopic search for galaxies in the epoch of reionization</i>	

As **Co-Investigator**

**JWST 6 GO** programs – PIs: Abdurro'uf, Zavala, Chisholm, Dunlop, Finkelstein, Kassin

**Keck 50+ nights** with DEIMOS, LRIS, MOSFIRE – PIs: Cooper, Casey, Finkelstein, Larson, Hutchison

**HST 2 GO & 2 AR** programs – PIs: Finkelstein, Jimenez-Andrade, Cleri

**ALMA 1 Cycle 7** (24.7 hr) – PI: Hashimoto & **1 Cycle 8 DDT** (11.7hr) – PI: Yoon

## Publication Statistics

**60 papers in total (49 refereed), >2000 citations, H-index 26** (as of Nov, 2023)

**\*10 1st/2nd author papers (283 citations):** 8 1st-author papers (6 published, 2 currently under review)

## Teaching & Mentoring Experience

<b>Mentor</b> in the PhA Mentorship program, Physics & Astronomy, Johns Hopkins Univ.	2023 – Present
Department-wide mentorship program for all career levels (undergraduates, graduates, and postdocs)	

### Intern Student Mentoring

- Mentor for the STScI Space Astronomy Summer Program: Turaba Rahman (the Kent State Univ.) 2023  
Project: *Spatially Resolved Stellar Populations of  $z \sim 4 - 6$  Lyman-alpha-emitters with JWST imaging*
- Mentor for the Summer Internship Program at NASA GSFC: Seonwoo Kim (Yonsei Univ. → UIUC) 2022  
Project: *Evolution of Lyman Alpha Line Widths at the End of Reionization*

### Training in Teaching & Mentorship

Completion of <i>Concentration in Teaching and Mentoring Courses</i> **, UT Austin, TX	08/2018
--	---------

\*\*Three courses for PhD and postdoctoral fellows for improving teaching and mentoring abilities

<b>Guest lecture</b> in <i>Galaxies and the Universe</i> class, UT Austin, TX	04/2017
---	---------

TA for 7 astronomy courses at UT Austin, TX & Yonsei University, Korea	2010 – 2017
--	-------------

**Service Experience / Public Outreach**

<b>Subject Matter Expert* for NASA's Webb Space Telescope Community Events</b>	2021 – 2022
*Speaker at the JWST Public Talk at Cape Fear Museum of History and Science on 10/15/2021	
<b>Scientist Featured in a NASA JWST Astronomy Day Q&amp;A in Social Media</b>	05/2021
<b>Proposal Review External Panel</b> for HST (Cycle 28 & 29) & ALMA (Cycle 8)	2020 – Present
<b>Journal Referee</b> for ApJ, A&A, MNRAS	2019 – Present
<b>Subject-matter Expert Reviewer</b> in a NASA peer review	2021
Development Team of Exemplar Key Science Programs For GMT and TMT	2018 Fall
Graduate student committee for the 2017 Dept external review self-study, UT Austin, TX	2017
Representative to the Graduate Student Assembly, UT Austin, TX	2016 – 2017
Seminar speaker to the TAURUS undergrad summer research program, UT Austin	2016 Summer
Student Representative at the Astronomy department, Yonsei University, Seoul, Korea	2007 – 2008
Military Service, the Military Police in Republic of Korea Army, Hwacheon, Korea	2005 – 2007

**Collaborations**

JWST-**CEERS** (PI: Finkelstein), JWST-**Cosmic Spring** (PI: Coe), JWST-**NGDEEP** (Co-PIs: Finkelstein, Papovich and Pirzkal), HST-**CLEAR** (PI: Papovich), HST-**CANDELS** (Co-PIs: Faber & Ferguson), VLT-**VANDELS** (Co-PIs: McLure, & Pentericci)

**Colloquia/Seminar Talks**

Colloquium, HotSci Summer Colloquium at JHU/STScI, Baltimore, MD, USA	08/2023
Seminar Talk, Arizona State University, Tempe, AZ, USA	11/2021
Seminar Talk, Georgia Tech, Atlanta, GA, USA	11/2021
EURECA Seminar Talk, University of Arizona, Tucson, AZ, USA	09/2021
Seminar Talk, Seoul National University, Seoul, Korea	07/2021
Seminar Talk, Yonsei University, Seoul, Korea	06/2021
Seminar Talk, Director's Seminar, SED, NASA GSFC, Greenbelt, MD	03/2021
Colloquium, Department of Physics and Astronomy, University of Louisville	02/2021
Seminar Talk, Galaxies & AGN Journal Club at STScI/JHU, Baltimore, MD, USA	02/2021
Colloquium, Astrophysics Science Division Colloquium, NASA GSFC, Greenbelt, MD	05/2020
Seminar Talk, University of California - Riverside, Riverside, CA	10/2018
Seminar Talk, Yonsei University, Seoul, Korea	04/2018
Best Paper Award Talk, Korean-American Scientists & Engineers Association-Austin, TX	02/2017
Seminar Talk, Korea Astronomy Space Science Institute, Daejeon, Korea	12/2016

**Other Presentations**

Contributed Talk, Roman Science Inspired by Emerging JWST Results, STScI, MD, USA	06/2023
Contributed Talk, CEERS Team Meeting, Austin, TX, USA	05/2023
Contributed Talk, Summer All Zoom Epoch of Reionization Astronomy Conference 2.0	06/2021
Contributed Talk, Summer All Zoom Epoch of Reionization Astronomy Conference	07/2020
Contributed Talk, AAS 235th Meeting, Honolulu, HI, USA	01/2020
Contributed Talk, Extremely Big Eyes ... UCLA, Los Angeles, CA, USA	01/2019
Contributed Talk, Special session talk, AAS 233rd Meeting, Seattle, WA, USA	01/2019
Poster, AAS 233rd Meeting, Seattle, WA, USA	01/2019
Poster, Tokyo Spring Cosmic Lyman-Alpha Workshop, Tokyo, Japan	03/2018
Contributed Talk, The growth of galaxies in the Early Universe – IV, Sesto, Italy	01/2018
Dissertation Talk, 231st AAS Meeting, Washington DC, USA	01/2018
Poster, BashFest 2017, Austin, TX, USA	10/2017
Contributed Talk, 5 <sup>th</sup> GMT Community Science Meeting, Tarrytown, NY, USA	09/2017
Poster, AAS 230th Meeting, Austin, TX, USA	06/2017
Contributed Talk, Snowbird Cosmic Lyman-Alpha Workshop, Snowbird, UT, USA	03/2017
Contributed Talk, 2016 Santa Cruz Galaxy Workshop, Santa Cruz, CA, USA	08/2016
Contributed Talk, Signals from the Deep Past, Valletta, Malta	07/2016

Poster, AAS 227th Meeting, Kissimmee, FL, USA	01/2016
Contributed Talk, 2015 CANDELS Team Meeting, Santa Cruz, CA, USA	07/2015
Defense talk, Qualifying exam/2nd-year Defense, Austin, TX, USA	05/2015
Poster, South by High Redshift, Austin, TX, USA	04/2015
Contributed Talk, Sussing Merger Trees, Midhurst, West Sussex, UK	07/2013

## References

**Dr. Harry Ferguson**, Space Telescope Science Institute, MD (Email: ferguson@stsci.edu)  
**Prof. Steven L. Finkelstein**, University of Texas at Austin, TX (Email: stevenf@astro.as.utexas.edu)  
**Dr. Dan Coe**, Space Telescope Science Institute, MD (Email: dcof@stsci.edu)

## Publications

**60 papers in total (49 refereed), >2000 citations, H-index 26** (as of Nov 2023)

**As 1st/2nd Author (283 citations): 8 1st-author papers (6 published, 2 submitted)**

1. **Jung et al. 2023, submitted to ApJ, arXiv:2304.05385**, *CEERS: Diversity of Lyman-Alpha Emitters during the Epoch of Reionization*
2. **Jung et al. 2022b, submitted to ApJ, arXiv:2212.09850**, *New  $z > 7$  Lyman-alpha Emitters in EGS: Evidence of an Extended Ionized Structure at  $z \sim 7.7$*
3. **Jung et al. 2022a, ApJ, 933, 87**, *CLEAR: Boosted Ly $\alpha$  Transmission of the Intergalactic Medium in UV bright Galaxies*
4. H. Park, **I. Jung**, et al. **2021, ApJ, 922, 263**, *Crucial Factors of Lyman-alpha Transmission in the Reionizing Intergalactic Medium: Infall Motion, HII Bubble Size, and Self-shielded Systems*
5. **Jung et al. 2020, ApJ, 904, 144**, *Texas Spectroscopic Search for Ly $\alpha$  Emission at the End of Reionization III. the Ly $\alpha$  Equivalent-width Distribution and Ionized Structures at  $z > 7$*
6. **Jung et al. 2019, ApJ, 877, 146**, *Texas Spectroscopic Search for Ly $\alpha$  Emission at the End of Reionization II. The Deepest Near-infrared Spectroscopic Observation at  $z \gtrsim 7$*
7. **Jung et al. 2018, ApJ, 864, 103**, *Texas Spectroscopic Search for Ly $\alpha$  Emission at the End of Reionization I. Constraining the Ly $\alpha$  Equivalent-width Distribution at  $6.0 < z < 7.0$*
8. **Jung et al. 2017, ApJ, 834, 81**, *Evidence for reduced specific star formation rates in the centers of massive galaxies at  $z = 4$*
9. **Jung et al. 2014, ApJ, 749, 74**, *Effects of Large-scale Environment on the Assembly History of Central Galaxies*
10. S. Peirani, **I. Jung**, J. Silk, and C. Pichon, **2012, MNRAS, 427, 2625**, *Evolution of the baryon fraction in the Local Group: accretion versus feedback at low and high  $z$*

**As Contributing Author** (incl. 8 submitted)

1. Finkelstein et al. (incl. **I. Jung**) 2023, arXiv, arXiv:2311.04279, *The Complete CEERS Early Universe Galaxy Sample: A Surprisingly Slow Evolution of the Space Density of Bright Galaxies at  $z \sim 8.5$ -14.5*
2. Arrabal Haro et al. (incl. **I. Jung**) 2023, Natur, 622, 707, *Confirmation and refutation of very luminous galaxies in the early Universe*
3. Shen et al. (incl. **I. Jung**) 2023, arXiv, arXiv:2310.13745, *NGDEEP Epoch 1: Spatially Resolved H $\alpha$  Observations of Disk and Bulge Growth in Star-Forming Galaxies at  $z \sim 0.6$  - 2.2 from JWST NIRISS Slitless Spectroscopy*
4. Leung et al. (incl. **I. Jung**) 2023, ApJL, 954, L46, *NGDEEP Epoch 1: The Faint End of the Luminosity Function at  $z \sim 9$ -12 from Ultradeep JWST Imaging*
5. Cooper et al. (incl. **I. Jung**) 2023, arXiv, arXiv:2309.06656, *The Web Epoch of Reionization Lyman-alpha Survey (WERLS) I. MOSFIRE Spectroscopy of  $z \sim 7$  - 8 Lyman-alpha Emitters*
6. Napolitano et al. (incl. **I. Jung**) 2023, A&A, 677, A138, *Identifying Ly $\alpha$  emitter candidates with Random Forest: Learning from galaxies in the CANDELS survey*
7. Bradley et al. (incl. **I. Jung**) 2023, ApJ, 955, 13, *High-redshift Galaxy Candidates at  $z = 9$ -10 as Revealed by JWST Observations of WHL0137-08*
8. Mascia et al. (incl. **I. Jung**) 2023, arXiv, arXiv:2309.02219, *New insight on the nature of cosmic reionizers from the CEERS survey*

9. Larson et al. (incl. **I. Jung**) 2023, ApJL, 953, L29, *A CEERS Discovery of an Accreting Supermassive Black Hole 570 Myr after the Big Bang: Identifying a Progenitor of Massive  $z > 6$  Quasars*
10. Backhaus et al. (incl. **I. Jung**) 2023, arXiv, arXiv:2307.09503, *CEERS Key Paper VIII: Emission Line Ratios from NIRSpec and NIRCам Wide-Field Slitless Spectroscopy at  $z > 2$*
11. Urbano Stawinski et al. (incl. **I. Jung**) 2023, arXiv, arXiv:2307.04782, *Deeper than DEEP: A Spectroscopic Survey of  $z > 3$  Lyman-alpha Emitters in the Extended Groth Strip*
12. Arrabal Haro et al. (incl. **I. Jung**) 2023, ApJL, 951, L22, *Spectroscopic Confirmation of CEERS NIRCам-selected Galaxies at  $z \approx 8-10$*
13. Yoon et al. (incl. **I. Jung**) 2023, ApJ, 950, 61, *ALMA Observation of a  $z \gtrsim 10$  Galaxy Candidate Discovered with JWST*
14. Fujimoto et al. (incl. **I. Jung**) 2023, ApJL, 949, L25, *CEERS Spectroscopic Confirmation of NIRCам-selected  $z \gtrsim 8$  Galaxy Candidates with JWST/NIRSpec: Initial Characterization of Their Properties*
15. Heintz et al. (incl. **I. Jung**) 2023, arXiv, arXiv:2306.00647, *Extreme damped Lyman-alpha absorption in young star-forming galaxies at  $z = 9 - 11$*
16. Hsiao et al. (incl. **I. Jung**) 2023, ApJL, 949, L34, *JWST Reveals a Possible  $z \sim 11$  Galaxy Merger in Triply Lensed MACS0647-JD*
17. Cleri et al. (incl. **I. Jung**) 2023, ApJ, 948, 112, *CLEAR: High-ionization [Ne V]  $\lambda 3426$  Emission-line Galaxies at  $1.4 < z < 2.3$*
18. Simons et al. (incl. **I. Jung**) 2023, ApJS, 266, 13, *CLEAR: Survey Overview, Data Analysis, and Products*
19. Hsiao et al. (incl. **I. Jung**) 2023, arXiv, arXiv:2305.03042, *JWST NIRSpec spectroscopy of the triply-lensed  $z = 10.17$  galaxy MACS0647-JD*
20. Kartaltepe et al. (incl. **I. Jung**) 2023, ApJL, 946, L15, *CEERS Key Paper. III. The Diversity of Galaxy Structure and Morphology at  $z = 3 - 9$  with JWST*
21. Abdurro'uf et al. (incl. **I. Jung**) 2023, ApJ, 945, 117, *Spatially Resolved Stellar Populations of  $0.3 < z < 6.0$  Galaxies in WHL 0137-08 and MACS 0647+70 Clusters as Revealed by JWST: How Do Galaxies Grow and Quench over Cosmic Time?*
22. Trump et al. (incl. **I. Jung**) 2023, ApJ, 945, 35, *The Physical Conditions of Emission-line Galaxies at Cosmic Dawn from JWST/NIRSpec Spectroscopy in the SMACS 0723 Early Release Observations*
23. Zavala et al. (incl. **I. Jung**) 2023, ApJL, 943, L9, *Dusty Starbursts Masquerading as Ultra-high Redshift Galaxies in JWST CEERS Observations*
24. Bagley et al. (incl. **I. Jung**) 2023, arXiv, arXiv:2302.05466, *The Next Generation Deep Extragalactic Exploratory Public (NGDEEP) Survey*
25. Backhaus et al. (incl. **I. Jung**) 2023, ApJ, 943, 37, *CLEAR: Spatially Resolved Emission Lines and Active Galactic Nuclei at  $0.6 < z < 1.3$*
26. Finkelstein et al. (incl. **I. Jung**) 2022, ApJL, 940, L55, *A Long Time Ago in a Galaxy Far, Far Away: A Candidate  $z \sim 12$  Galaxy in Early JWST CEERS Imaging*
27. Welch et al. (incl. **I. Jung**) 2022, ApJL, 940, L1, *JWST Imaging of Earendel, the Extremely Magnified Star at Redshift  $z = 6.2$*
28. Papovich et al. (incl. **I. Jung**) 2022, ApJ, 937, 22, *CLEAR: The Ionization and Chemical-enrichment Properties of Galaxies at  $1.1 < z < 2.3$*
29. Matharu et al. (incl. **I. Jung**) 2022, ApJ, 937, 16, *CLEAR: The Evolution of Spatially Resolved Star Formation in Galaxies between  $0.5 \lesssim z \lesssim 1.7$  Using  $H\alpha$  Emission Line Maps*
30. McCarron et al. (incl. **I. Jung**) 2022, ApJ, 936, 131, *Stellar Populations of Ly $\alpha$ -emitting Galaxies in the HETDEX Survey. I. An Analysis of LAEs in the GOODS-N Field*
31. Park et al. (incl. **I. Jung**) 2022, ApJ, 931, 126, *Scattering of Ly $\alpha$  Photons through the Reionizing Intergalactic Medium: I. Spectral Energy Distribution*
32. Larson et al. (incl. **I. Jung**) 2022, ApJ, 930, 104, *Searching for Islands of Reionization: A Potential Ionized Bubble Powered by a Spectroscopic Overdensity at  $z = 8.7$*
33. Cleri et al. (incl. **I. Jung**) 2022, ApJ, 929, 3, *CLEAR: Paschen- $\beta$  Star Formation Rates and Dust Attenuation of Low-redshift Galaxies*
34. Finkelstein et al. (incl. **I. Jung**) 2022, ApJ, 928, 52, *A Census of the Bright  $z = 8.5-11$  Universe with the Hubble and Spitzer Space Telescopes in the CANDELS Fields*

35. Tacchella et al. (incl. **I. Jung**) 2022, ApJ, 927, 170, *On the Stellar Populations of Galaxies at  $z = 9-11$ : The Growth of Metals and Stellar Mass at Early Times*
36. Backhaus et al. (incl. **I. Jung**) 2022, ApJ, 926, 161, *CLEAR: Emission-line Ratios at Cosmic High Noon*
37. Simons et al. (incl. **I. Jung**) 2021, ApJ, 923, 203, *CLEAR: The Gas-phase Metallicity Gradients of Star-forming Galaxies at  $0.6 < z < 2.6$*
38. Garilli et al. (incl. **I. Jung**) 2021, A&A, 647, A150, *The VANDELS ESO public spectroscopic survey. Final data release of 2087 spectra and spectroscopic measurements*
39. Yang et al. (incl. **I. Jung**) 2021, ApJ, 908, 144, *JWST/MIRI Simulated Imaging: Insights into Obscured Star Formation and AGNs for Distant Galaxies in Deep Surveys*
40. Estrada-Carpenter et al. (incl. **I. Jung**) 2020, ApJ, 898, 171, *CLEAR. II. Evidence for Early Formation of the Most Compact Quiescent Galaxies at High Redshift*
41. Hutchison et al. (incl. **I. Jung**) 2019, ApJ, 879, 70, *Near-infrared Spectroscopy of Galaxies During Reionization: Measuring C III] in a Galaxy at  $z = 7.5$*
42. Hong et al. (incl. **I. Jung**) 2019, MNRAS, 483, 3950, *Statistics of two-point correlation and network topology for Ly  $\alpha$  emitters at  $z \approx 2.67$*
43. Broussard et al. (incl. **I. Jung**) 2019, ApJ, 873, 74, *Star Formation Stochasticity Measured from the Distribution of Burst Indicators*
44. McLure et al. (incl. **I. Jung**) 2018, MNRAS, 479, 25, *The VANDELS ESO public spectroscopic survey*
45. Pentericci et al. (incl. **I. Jung**) 2018, A&A, 616, A174, *The VANDELS ESO public spectroscopic survey: Observations and first data release*
46. Larson et al. (incl. **I. Jung**) 2018, ApJ, 858, 94, *Discovery of a  $z = 7.452$  High Equivalent Width Ly $\alpha$  Emitter from the Hubble Space Telescope Faint Infrared Grism Survey*
47. Wang et al. (incl. **I. Jung**) 2016, MNRAS, 459, 1554, *Sussing merger trees: stability and convergence*
48. Lee et al. (incl. **I. Jung**) 2014, MNRAS, 445, 4197, *Sussing merger trees: the impact of halo merger trees on galaxy properties in a semi-analytic model*
49. Srisawat et al. (incl. **I. Jung**) 2013, MNRAS, 436, 150, *Sussing Merger Trees: The Merger Trees Comparison Project*
50. Yi et al. (incl. **I. Jung**) 2013, A&A, 554, A122, *Merger relics of cluster galaxies*

All publications available on the ADS Public Library below:

<https://ui.adsabs.harvard.edu/public-libraries/VqKK7ngHQv2hTnwD6ULVrQ>