

# NIKKO J. CLERI

- » Position: PhD Candidate at Texas A&M University
- » Research: High-Redshift Galaxies, Galaxy Evolution, Emission-Line Galaxies, Population III Stars, Active Galactic Nuclei, Black Hole Seeds, Star Formation, Dust Attenuation

## »»» Summary

Nikko J. Cleri is a PhD candidate in astronomy at Texas A&M University, currently applying for postdoctoral positions. He studies emission-line galaxies with a focus on rest-frame UV/optical spectra of high-redshift galaxies. He primarily uses data from *JWST* and *HST*, and is a member of the CEERS (Cosmic Evolution Early Release Science), NGDEEP (Next Generation Deep Extragalactic Exploratory Public Survey), and CLEAR (CANDELS Lyman- $\alpha$  Emission at Reionization) collaborations. He is also very active in mentoring and outreach initiatives, currently serving as the coordinator for Texas A&M's Mentoring and Advising Graduates in an Inclusive Community (MAGIC) program.

## »»» Education

2021 - Present	<b>Ph.D. Astronomy</b>	Texas A&M University
» Advisor: Casey Papovich		
» Thesis: <i>Spectroscopic Studies of Stars and Black Holes Across Cosmic Time</i>		
2019 - 2021	<b>M.S. Physics</b>	University of Connecticut
» Advisor: Jonathan R. Trump		
» Thesis: <i>CLEAR: Paschen-<math>\beta</math> Star Formation Rates and Dust Attenuation in Low Redshift Galaxies</i>		
2015 - 2019	<b>B.S. Physics   Mathematics Minor</b>	University of Connecticut
» Advisor: Gerald V. Dunne		
» Undergraduate Research: <i>Resurgent Trans-Series for Non-Integrable Deformations of Painleve II</i>		

## »»» Academic and Professional Appointments

2021-	<b>Graduate Student</b> (Advisor: Prof. Casey Papovich)	TAMU
2021	<b>Research Technician</b> (Advisor: Prof. Jonathan Trump)	UConn
2019-21	<b>Graduate Student</b> (Advisor: Prof. Jonathan Trump)	UConn
2017-20	<b>Research Assistant</b> (Advisor: Prof. Gerald Dunne)	UConn
2018	<b>NSF REU Student</b> (Advisor: Prof. Louis Strigari)	TAMU

## »»» Awarded Proposals and Grants - Total Value: >\$135k

Principal Investigator		1
2021	<b>HST Cycle 29</b> - AR 16609: <i>Peering Through the Dust: Paschen-beta Indicators of Star Formation and Dust Attenuation</i>	~\$136k
Co-Investigator		2
2023	<b>JWST Cycle 2</b> - GO 3703: <i>Breaking the z=10 barrier with MIRI: redshift confirmation and detection of rest-frame optical emission lines</i> (PI: J. Zavala)	24.33 hours
2023	<b>Gemini</b> : GS-2023A-Q-136: <i>Optical Spectroscopy of JWST ERO Galaxies</i> (PI: B. Backhaus)	20 hours

## »»» Honors and Awards

2022	<b>Texas Space Grant Consortium Graduate Fellow</b> - \$5K	TAMU
2018	<b>NSF REU</b> - \$5K	TAMU

2016	<b>Dean's List</b> - College of Liberal Arts and Sciences	UConn
2015-19	<b>Governor's Scholarship</b> - \$8.5K/yr	UConn
2015	<b>Community Service Scholarship</b> - \$1K	UConn

### »»» Teaching Experience - Cumulative Enrollment: 361

2019-21	<b>TA</b> - PHYS 1501: Physics for Engineers I - Cumulative Enrollment: 253	UConn
2021	<b>TA/CA</b> - PHYS 1025: Introduction to Astronomy - Cumulative Enrollment: 108	UConn

### »»» Professional Service

2021-	<b>Referee</b> - Astrophysical Journal (ApJ)	
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### »»» Mentoring

2023-24	<b>Graduate Representative</b> - TAMU Astronomy	TAMU
2022-24	<b>Coordinator</b> - Mentoring and Advising Graduates in an Inclusive Community (MAGIC)	TAMU
2022-24	<b>Mentor</b> - Mentoring and Advising Graduates in an Inclusive Community (MAGIC)	TAMU
2017-18	<b>Mentor</b> - UConn Undergraduate Peer Mentoring	UConn

### »»» Outreach

2022-	<b>Volunteer</b> - Gateway to Graduate School	TAMU
2022-	<b>Demonstrator</b> - Physics and Engineering Festival	TAMU
2022	<b>High School Research Reviewer</b> - Lumiere	TAMU
2021-	<b>Presenter</b> - Astronomy on Tap BCS 'In the News'	TAMU
2021-22	<b>Treasurer</b> - Astronomy on Tap BCS	TAMU
2021-	<b>Pen-Pal</b> - Letters to a Pre-Scientist	TAMU
2018	<b>Volunteer</b> - Mitchell Institute Star Party Group	TAMU
2014-	<b>Member</b> - Booth Memorial Astronomical Society, Stratford, CT	

### »»» Societies and Organizations

2023	<b>LSSTC Data Science Fellowship Program</b>	Auditor
2018	<b>American Astronomical Society</b>	Member
2018	<b>American Physical Society</b>	Member
2018	<b>American Institute of Physics</b>	Member
2015	<b>Society of Physics Students</b>	Member

### »»» Observing Experience

2023	<b>W.M. Keck Observatory</b> - LRIS	3 nights
2018	<b>McDonald Observatory</b>	4 nights

### »»» Technical Skills and Programming Languages

Programming	<b>Fluent</b> - Python, LaTeX
	<b>Familiar</b> - SQL, Julia, C, C++, R, IDL, Mathematica, MATLAB
Software	<b>Fluent</b> - Cloudy, PyNeb
	<b>Familiar</b> - grizli, DS9, IRAF

### »»» Website Architect

- » **Personal Website:** tx.ag/cleri
- » **TAMU Astronomy** (with other grad students): tamu-astro.github.io/
- » **Mentoring and Advising Graduates in an Inclusive Community (MAGIC)** (with other grad students): tx.ag/tamumagic

## Publications

### Summary

- » Refereed: 30, Submitted: 6
- » Papers as Lead/Significant Author: 8
- » Total Citations: 1135, H-Index: 18, Reads: >24000 (from NASA ADS, updated October 2023)

### Lead/Co-Lead Author

4

- » **Cleri, N. J.**, Olivier, G. M., Hutchison T. A., et al. 2023, *Using [Ne VI]/[Ne III] to Understand the Nature of Extreme-ionization Galaxies*, ApJ, 953, 10
- » **Cleri, N. J.**, Yang, G., Papovich, C., et al. 2023, *CLEAR: High-Ionization [Ne VI]  $\lambda$ 3426 Emission-line Galaxies at  $1.4 < z < 2.3$* , ApJ, 948, 112
- » **Cleri, N. J.**, Trump, J. R., Backhaus, B. E., et al. 2022, *CLEAR: Paschen- $\beta$  Star Formation Rates and Dust Attenuation of Low Redshift Galaxies*, ApJ, 929, 3
- » **Cleri, N. J.**, Dunne, G. V., 2020, *Resurgent Trans-Series for Non-Integrable Deformations of Painleve II*, Journal of Physics A: Mathematical General, 53, 355203

### Significant Author

4

- » Larson, R.L., Finkelstein, S.L., Kocevski, D.D., Hutchison, T.A., Trump, J.R., Arrabal Haro, P., Bromm, V., **Cleri, N.J.**, et al. 2023, *A CEERS Discovery of an Accreting Supermassive Black Hole 570 Myr after the Big Bang: Identifying a Progenitor of Massive  $z > 6$  Quasars*, ApJL, 953, L29
- » Backhaus, B.E., Bridge J.S., Trump, J.R., **Cleri, N.J.**, et al. 2023, *CLEAR: Detecting Low-Luminosity Active Galactic Nuclei at  $0.6 < z < 1.3$  via Spatially Resolved Hubble Space Telescope Grism Emission Line Ratios*, ApJ, 943, 37.
- » Prescott, M.K.M., Finlator, K.M., **Cleri, N.J.**, et al. 2022, *Using Multiple Emission Line Ratios to Constrain the Slope of the Dust Attenuation Law*, ApJ, 928, 71
- » Backhaus, B.E., Trump, J.R., **Cleri, N.J.**, et al. 2022, *CLEAR: Emission Line Ratios at Cosmic High Noon*, ApJ, 926, 161

### Co-Author: Refereed

22

- » Fujimoto, et al. 2023, *ALMA FIR View of Ultra High-redshift Galaxy Candidates at  $z \sim 11-17$ : Blue Monsters or Low- $z$  Red Interlopers?*, ApJ, 955, 130
- » Kocevski, D.D., et al. 2023, *Hidden Little Monsters: Spectroscopic Identification of Low-Mass, Broad-Line AGN at  $z > 5$  with CEERS*, ApJL, 954, L4
- » Arrabal Haro, P., et al. 2023, *Spectroscopic confirmation of CEERS NIRCам-selected galaxies at  $z \simeq 8 - 10$* , ApJL, 951, L22
- » Estrada-Carpenter, V., et al. 2023, *CLEAR: The Morphological Evolution of Galaxies in the Green Valley*, arXiv e-prints, arXiv:2305.04953
- » Yang, G., et al. 2023, *CEERS Key Paper VI: JWST/MIRI Uncovers a Large Population of Obscured AGN at High Redshifts*, ApJL, 950, L5
- » Papovich, C., et al. 2023, *CEERS Key Paper IV: Galaxies at  $4 < z < 9$  are Bluer than They Appear – Characterizing Galaxy Stellar Populations from Rest-Frame  $\sim 1$  micron Imaging*, ApJL, 949, L18
- » Simons, R.C., et al. 2023, *CLEAR: Survey Overview, Data Analysis and Products*, ApJS, 266, 13
- » Constantin, L. et al. 2023, *Expectations of the size evolution of massive galaxies at  $3 \leq z \leq 6$  from the TNG50 simulation: the CEERS/JWST view*, ApJ, 946, 71
- » Perez-Gonzalez, P.G., et al. 2022, *CEERS Key Paper V: A triality on the nature of HST-dark galaxies*, ApJL, 946, L16
- » Kocevski, D. et al. 2023, *CEERS Key Paper II: The Resolved Host Properties of AGN at  $3 < z < 5$  with JWST*, ApJL, 946, L14
- » Finkelstein, S.L., et al. 2023, *CEERS Key Paper I: An Early Look into the First 500 Myr of Galaxy Formation with JWST*, ApJL, 946, L13

- » Guo, Y. et al. 2023, *First Look at  $z > 1$  Bars in the Rest-Frame Near-Infrared with JWST Early CEERS Imaging*, ApJL, 945, L10
- » Trump, J.R. et al. 2023, *The Physical Conditions of Emission-Line Galaxies at Cosmic Dawn from JWST/NIRSpec Spectroscopy in the SMACS 0723 Early Release Observations*, ApJ, 945, 35
- » García-Argumánez, A. et al. 2023, *Probing the earliest phases in the formation of massive galaxies with simulated HST+JWST imaging data from Illustris*, ApJ, 944, 3
- » Zavala, J. et al. 2023, *Dusty starbursts masquerading as ultra high redshift galaxies in JWST observations*, ApJL, 943, L9
- » Rose, C. et al. 2023, *Identifying Galaxy Mergers in Simulated CEERS NIRCам Images using Random Forests*, ApJ, 942, 54
- » Finkelstein, S.L. et al. 2022, *A Long Time Ago in a Galaxy Far, Far Away: A Candidate  $z \sim 14$  Galaxy in Early JWST CEERS Imaging*, ApJL, 940, L55
- » Papovich, C. et al. 2022, *CLEAR: The Ionization and Chemical-Enrichment Properties of Galaxies at  $1.1 < z < 2.3$*  ApJ, 937, 22
- » Matharu, J. et al. 2022, *CLEAR: The Evolution of Spatially Resolved Star Formation in Galaxies between  $0.5 \leq z \leq 1.7$  using  $H\alpha$  Emission Line Maps*, ApJ, 937, 16
- » Jung, I. et al. 2022, *CLEAR: Boosted  $Ly\alpha$  Transmission of the Intergalactic Medium in UV bright Galaxies*, ApJ, 933, 87
- » Simons, R. C. et al. 2021, *CLEAR: The Gas-Phase Metallicity Gradients of Star-Forming Galaxies at  $0.6 < z < 2.6$* , ApJ, 923, 203
- » Estrada-Carpenter, V. et al. 2020, *CLEAR II: Evidence for Early Formation of the Most Compact Quiescent Galaxies at High Redshift*, ApJ, 880, 2

Co-Author: Submitted

6

- » Kirkpatrick, A., et al. 2023, *CEERS Key Paper VII: JWST/MIRI Reveals a Faint Population of Galaxies at Cosmic Noon Unseen by Spitzer*, arXiv e-prints, arXiv:2308.09750
- » Backhaus, B.E., et al. 2023, *CEERS Key Paper VII: Emission Line Ratios from NIRSpec and NIRCам Wide-Field Slitless Spectroscopy at  $z > 2$* , arXiv e-prints, arXiv:2307.09503
- » Calabró, A. et al. 2023, *Near-infrared emission line diagnostics for AGN from the local Universe to redshift 3*, arXiv e-prints, arXiv:2306.08605
- » Barro, G., et al. 2023, *Extremely red galaxies at  $z = 5 - 9$  with MIRI and NIRSpec: dusty galaxies or obscured AGNs?*, arXiv e-prints, arXiv:2305.14418
- » Jung, I., et al. 2023, *CEERS: Diversity of Lyman-Alpha Emitters during the Epoch of Reionization*, arXiv e-prints, arXiv:2304.05385
- » Jung, I. et al. 2022, *New  $z > 7$  Lyman-alpha Emitters in EGS: Evidence of an Extended Ionized Structure at  $z \sim 7.7$* , arXiv e-prints, arXiv:2212.09850

## »»» Presentations

### Research Presentations

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11 September 2023	<i>Emission Line Ratio Diagnostics of AGN, Black Hole Seeds and Population III Stars with JWST</i> at the First Year of JWST Science Conference, Space Telescope Science Institute, Baltimore, Maryland, USA	Poster
17 August 2023	<i>Diagnostics of Exotic Ionizing Sources with JWST</i> at Texas A&M Astrosymposium, College Station, Texas, USA	Talk
10 May 2023	<i>Diagnostics of Exotic Ionizing Sources Across Cosmic Time - High-Ionization Emission-Line Ratios: Ne53</i> at University of Texas, Austin, Texas, USA	Talk
12 January 2023	<i>High-Ionization [Ne VI] Emission-Line Galaxies at Cosmic Noon and the Epoch of Reionization</i> at AAS 241st Meeting, Seattle, Washington, USA	Poster
2 December 2022	<i>Using [Ne VI] to Constrain the Sources of Highly-Energetic Photoionization Across Cosmic Time: Exploring the "Mystery of Neon" with HST and JWST</i> at Texas A&M University, College Station, Texas, USA	Talk
18 August 2022	<i>Extreme High-Ionization Emission-Line Galaxies at Cosmic Noon and the Epoch of Reionization: Exploring the "Mystery of Neon" with HST and JWST</i> at Texas A&M University, College Station, Texas, USA	Talk
22 July 2022	<i>The Evolution of Spectroscopy from HST to JWST: Implications for the Epoch of Reionization</i> at Texas A&M University, College Station, Texas, USA	Talk
14 June 2022	<i>HST Grism Observations of Paschen-Line Star-Formation and Dust Attenuation: A Precursor to the JWST Era</i> at AAS 240th Meeting, Pasadena, California, USA	Poster
27 August 2021	<i>Paschen-<math>\beta</math> Star Formation Rates and Dust Attenuation with HST and JWST</i> at Texas A&M Astrosymposium, College Station, Texas, USA	Talk
13 January 2021	<i>CLEAR: Paschen-<math>\beta</math> Star Formation Rates and Dust Attenuation in Low Redshift Galaxies</i> at AAS 237th Meeting, Virtual	Poster
9 January 2019	<i>Modeling <math>^8\text{B}</math> Solar Neutrino Detection with CE<math>\nu</math>NS</i> at AAS 233rd Meeting, Seattle, Washington, USA	Poster
1 August 2018	<i>Modeling <math>^8\text{B}</math> Solar Neutrino Detection with CE<math>\nu</math>NS</i> at TAMU Undergraduate Research Poster Session, College Station, Texas, USA	Poster

### Outreach and Professional Development Presentations

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28 July 2023	<i>How to Get Into Grad School</i> at Texas A&M University, College Station, Texas, USA	Panel
11 November 2022	<i>Data Visualization in Astronomy: More Important than the Science Itself?</i> at Texas A&M University, College Station, Texas, USA	Talk
29 July 2022	<i>How to Get Into Grad School</i> at Texas A&M University, College Station, Texas, USA	Panel
2 June 2022	<i>Data Visualization in Astronomy: More Important than the Science Itself?</i> at Texas A&M University, College Station, Texas, USA	Talk
2 June 2022	<i>Matplotlib: The Champion of Plotting in Python</i> at Texas A&M University, College Station, Texas, USA	Workshop
1 June 2022	<i>pandas: Your Best Friend for Data Analysis in Python</i> at Texas A&M University, College Station, Texas, USA	Workshop

## »»» References

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PhD Advisor      **Prof. Casey J. Papovich**      Texas A&M

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- » papovich@tamu.edu

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M.S. Advisor      **Prof. Jonathan R. Trump**      UConn

- » University of Connecticut Department of Physics, 196A Auditorrium Road, Unit 3046, Storrs, CT, 06269-3046
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PhD Mentor      **Prof. Robert C. Kennicutt**      Texas A&M

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- » rck@tamu.edu