

Current Position	Assistant Research Scientist, Arizona State University, Phoenix, AZ
Research Output	35 Papers: 9 First Author, 4 Student, 22 Contributor. <i>h</i> -index: 12
Mentoring	Worked with Prof. Rogier Windhorst to supervise and mentor a group of over 5 graduate students and over 10 undergraduates
Awards	HST & JWST Proposals: 1 PI, 1 Co-PI, 3 Co-I

Academic Positions

- 2023–current **Assistant Research Scientist**, *Arizona State University*, Phoenix, AZ
- 2020–2023 **Postdoctoral Fellow**, *Arizona State University*, Phoenix, AZ
- 2018–2020 **Postdoctoral Researcher**, *University of Missouri*, Columbia, MO
- 2015–2018 **Graduate Student Researcher**, *UC Irvine*, Irvine, CA
- 2014–2018 **Graduate Outreach Coordinator**, *UC Irvine*, Irvine, CA
- 2012–2015 **Teaching Assistant**, *UC Irvine*, Irvine, CA

Education

- 2018 **Ph.D., Physics**, *University of California, Irvine*, Irvine, CA
Diffuse Gas and Diffuse Galaxies – Investigations into the State of Molecular Gas in High-*z* Galaxies and the Origin of Ultra-Diffuse Galaxies
- 2014 **M.S., Physics**, *University of California, Irvine*, Irvine, CA
- 2012 **B.S., Physics and Astronomy**, *University of Arizona*, Tucson, AZ

Research Interest

I am particularly interested in how **dwarf galaxies** evolve over time. To study these objects, I use both **observations and simulations**.

Approved Proposals and Awards

Proposals

- 2024 **PI**, *HI and UV Observations of an Quiescent Isolated Dwarf Galaxy Observed with JWST*, Green Bank Telescope, 3.75 Hours
- 2024 **PI**, *How to Form an Isolated Quiescent Dwarf Galaxy*, MMT Binospec IFU, 1 night
- 2024 **Co-I**, *How Isolated is PEARLSDG?*, MMT Hectospec, 1 night

- 2024 **Deputy Co-I**, *DARK-SKY: Constrain Zodiacal Light & Diffuse Extragalactic Background Light from Archival JWST Images*, JWST Archival, \$800,000
 - 2023 **Co-I**, *ArchExtract: Maximizing Hubble’s Archival Legacy of Slitless Spectroscopy*, HST Archival
 - 2022 **PI**, *LBT: Deep U+R-band Imaging of the Lensing Cluster MACS1149+2223*, 1 Night Band B time
 - 2022 **Co-I**, *Keck DEIMOS - Unravelling the origins of ultra-diffuse galaxies in the Perseus cluster*, 3 Nights
 - 2020 **PI**, *HST-AR-16605*, HST: Hot or Cold? Improving Constraints on the Thermal Foreground of HST, \$109,975
 - 2020 **Co-PI**, *HST-AR-16604*, Resolved Stellar Populations and the Multi-Wavelength Structure of Dwarf Galaxies in the Frontier Fields, \$97,416
 - 2019 **Co-I**, *HST-AR-15798*, UV Light Reveals the Life of Giant Star-forming Clumps
- [Awards](#)
- 2023 **Nominated for Outstanding Faculty Mentor Award**
 - 2018 **Postdoctoral Travel Grant, University of Missouri**, \$250
 - 2015–2017 **ARCS Scholar, University of California, Irvine**, \$15,000

Teaching

- 2020–2022 **“Python in Astronomy” Independent Module**, *Arizona State University*
Developed 14 projects to help teach python and demonstrate how it can be used in astronomy. They were used as a teaching tool for 30 weeks of python instruction with undergraduate/graduate students
- 2022 **Coding for Exploration: Substitute Lecture**, *Arizona State University*
Substitute lecture on python I/O
- 2018–2019 **Programming Mentor**, *University of Missouri*
Organized weekly python tutorials with junior graduate students and served as resource for students who need help with coding
- 2014, 2016, **COSMOS Teaching Assistant**, *University of California, Irvine*
2017 Led high school students through a summer research project
- 2012–2016 **Teaching Assistant**, *University of California, Irvine*
Led discussions and labs for introductory physics and astronomy classes; provided weekly tutoring sessions
- 2014 **Educator Consultant**, *ESCAPE Summer Institute in Earth Science*
Assisted K-12 educators in the development of new STEM lessons

Mentoring

Graduate Students

Since 2020, I have provided significant mentoring and instruction for 5 graduate students

Isabel McIntyre	Student Paper [1]	
Alex Pigarelli	Student Paper in prep	
Rosalia O'Brien	Student Papers [4]	Chambliss Award Winner ASU GPSA Service Award Winner
Delondrae Carter*	Student Paper in prep	Graduate College IEF fellowship
Jessica Berkheimer*	Student Paper [3]	LEAP Scholar

*Started as ASU Undergraduate

Undergraduate Students

In that time I have also provided mentoring and support for 12 undergraduate students including

Tejovrash Acharya	Ashton Cardona	Noah McLeod
Jake Summers	Arnav Gahlot	Zak Goisman
Hanga Andras-Letanovszky	Daniel Henningson	Andi Swirbul
Ci'mone Rogers	Moksh Ahuja	Apurva More

High School Students

In that time I have also provided mentoring and support for 2 high school students

Purvansh Bhati, Student Paper [2]	Rushabh Pawnikar
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Outreach

2014–2018 **Graduate Outreach Coordinator, UCI Observatory**

Hosted public nights at the observatory; scheduled over 50 events with local schools and organizations with programming tailored to meet specific needs

2012 **Public Telescope Operator, Raymond E. White Telescope**

Observed and annotated astronomical objects to general education students and the public

Talks

2024 *An Unexpected Dwarf Galaxy*. Homolvi State Park Star Party

2024 *PEARLSDG*. AAS Press Conference

2019 *The Big Bang to the Periodic Table*. Nuclear Science & Engineering for Secondary Science Teachers

2013 *The Sky Tonight*. ASUCI Student Night at the UCI Observatory

2013 *Meteor Showers and Solar System Debris*. Perseid Meteor Shower Visitor Night at the UCI Observatory

Press Releases

- 2024 **Team of astronomers led by ASU scientist discovers galaxy that shouldn't exist**, <https://news.asu.edu/20240131-science-and-technology-team-astronomers-led-asu-scientist-discovers-galaxy-shouldnt-exist>
- 2024 **Data analysis with ASU SKYSURF team earns high school student first published research paper**, <https://news.asu.edu/20240619-science-and-technology-data-analysis-asu-skysurf-team-earns-high-school-student-first>
- 2023 **Webb Spotlights Gravitational Arcs in 'El Gordo' Galaxy Cluster**, <https://webbtelescope.org/contents/news-releases/2023/news-2023-119>
- 2022 **Hubble Detects Ghostly Glow Surrounding Our Solar System**, <https://hubblesite.org/contents/news-releases/2022/news-2022-050>

Community Service

- 2024 **Member**, Roman Space Telescope Calibration Working Group
- 2022-2023 **Primary Organizer**, SESE Internal Symposium
- 2022-2024 **Primary Organizer**, SESE Extragalactic Journal Club
- 2021-2023 **Co-Organizer**, SESE Summer Extragalactic Talk Series
- 2020-2022 **Co-Organizer**, SESE Extragalactic Journal Club
- 2021 **Co-Organizer**, First SESE Internal Symposium
- 2020-2021 **Member**, SESE JEDI Task Force
- Reviewer**, NASA, STScI, A&A, ApJ, MNRAS, PRL, NSF Galaxy Evolution Theory, NSF Galaxy Evolution Observations, Swinburne University

Selected Talks

- [1] *Isolated Quiescent Dwarf Galaxies*. Steward Observatory Lunch Talk: April 29, 2024
- [2] *Properties of UDGs across Cosmic Time*. Diffuse Cosmic Backgrounds and the Low Surface Brightness Universe: April 1-5, 2024, Aspen Center for Physics
- [3] *Low Density Galaxies at $z=0.87$* . The Sunrise of Ultra-Diffuse Galaxies: June 26-30, 2023, Sexten Center for Astrophysics
- [4] *Ultra-Diffuse Galaxies Observed in the El-Gordo Cluster with JWST*. First Science Results with JWST: Dec 12-15, 2022, Space Telescope Science Institute
- [5] *Ultra-Diffuse Galaxies: Solutions and problems*. UC Santa Cruz: April 18, 2022, Invited
- [6] *First Results from the SKYSURF Project*. SphereX Team Meeting: May 24, 2022, Invited
- [7] *Ultra Diffuse Galaxies and the SKYSURF Project*. Swinburne University: Sept 1, 2021, Invited

- [8] *The SKYSURF Project Overview*. Macquarie University: Aug 13, 2020, *Invited*
- [9] *The formation of Ultra-diffuse galaxies through tidal heating*. STSCI Lunch Talk: Oct 4, 2019, *Invited*
- [10] *Evidence for Stochastic Quenching in Massive Galaxies at $z \sim 1$* . MARAC Meeting: April 12, 2019
- [11] *The Origins of Ultra-Diffuse Galaxies*. CANDELS Meeting: October 24, 2018, University of Massachusetts
- [12] *Tidally Disrupted Halos as the Hosts of Ultra-Diffuse Galaxies*. GalFRESCA: August 25, 2017, Caltech
- [13] *Searching for Ultra-Diffuse Galaxies in the Bolshoi Simulation*. Santa Cruz Galaxy Workshop: August 10, 2017, UC Santa Cruz
- [14] *The CO-H₂ Conversion Factor at $z < 1.5$* . Multi-Scale Star Formation Conference: April 5, 2017, Morelia, Mexico
- [15] *Star Formation in Young Galaxies*. ARCS Research Symposium: March 16, 2017, UC Irvine

Publication List

Lead Author

- [1] *Extreme Metallicity Dwarf Galaxies in IllustrisTNG*. 2024. **Carleton, T.** & Monkiewicz, J. arXiv:2408.09517
- [2] *New Spectroscopic Redshift Places PEARLSGD in a Group at ~ 124 Mpc*. 2024. **Carleton, T.** et al. RNAAS, 8, 181
- [3] *PEARLS: A Potentially Isolated Quiescent Dwarf Galaxy with a TRGB Distance of 30 Mpc*. 2024. **Carleton, T.** et al. ApJL, 961, 37
- [4] *PEARLS: Low Stellar Density Galaxies in the El Gordo Cluster Observed with JWST*. 2023. **Carleton, T.** et al. ApJ, 953, 83
- [5] *SKYSURF: Constraints on Zodiacal Light and Extragalactic Background Light through Panchromatic HST All-Sky Surface-Brightness Measurements: II. First Limits on Diffuse Light at 1.25, 1.4, and 1.6 microns*. 2022. **Carleton, T.** et al. AJ, 164, 170
- [6] *An excess of globular clusters in Ultra-Diffuse Galaxies formed through tidal heating*. 2021. **Carleton, T.** et al. MNRAS, 502, 394
- [7] *Evidence for Non-smooth Quenching in Massive Galaxies at $z \sim 1$* . 2020. **Carleton, T.** et al. MNRAS, 491, 2822
- [8] *The Formation of Ultra Diffuse Galaxies in Cored Dark Matter Halos Through Tidal Stripping*. 2019. **Carleton, T.** et al. MNRAS, 485, 382
- [9] *PHIBSS: exploring the dependence of the CO-H₂ conversion factor on total mass surface density at $z < 1.5$* . 2017. **Carleton, T.** et al. MNRAS, 476, 4886

Student Papers

- [1] *SKYSURF VI: The Impact of Thermal Variations of HST on Background Light Estimates*. 2024. McIntyre, I., **Carleton, T.** et al. arXiv:2407.12290
- [2] *SKYSURF-5: Probing the Integrated Galaxy Light with a SDSS-SKYSURF Cross-matched Catalog*. 2024. Bhatia, P., **Carleton, T.**, et al. RNAAS, 8, 154
- [3] *JWST NIRC*am* Photometry: A Study of Globular Clusters Surrounding Bright Elliptical Galaxy VV 191*a* at $z = 0.0513$* . 2023. Berkheimer, J., **Carleton, T.** et al. ApJL, 964, 29
- [4] *SKYSURF-4: Panchromatic Full Sky Surface Brightness Measurement Methods and Results*. 2022. O'Brien, **Carleton, T.**, et al. AJ, 165, 230

Contributing Author

- [1] *Birds of a Feather: Resolving Stellar Mass Assembly With JWST/NIRC*am* in a Pair of Kindred $z \sim 2$ Dusty Star-forming Galaxies Lensed by the PLCK G165.7+67.0 Cluster*. 2024. Kamieneski, P., Frye, B., Windhorst, R., Harrington, K., Yun, M., Noble, A., Pascale, M., Foo, N., Cohen, S., Jansen, R., **Carleton, T.**, et al. arXiv:2404.08058

- [2] *PEARLS: Discovery of Point-Source Features Within Galaxies in the North Ecliptic Pole Time Domain Field*. 2024. Ortiz, R., Windhorst, R., Cohen, S., Willner, S., Jansen, R., **Carleton, T.** et al. arXiv:2404.10709
- [3] *TREASUREHUNT: Transients and Variability Discovered with HST in the JWST North Ecliptic Pole Time-domain Field*. 2024. O'Brien, R., Jansen, R., Grogin, N., Cohen, S., Smith, B., Silver, R., Maksym, W., Windhorst, R., **Carleton, T.**, et al. ApJS, 272, 19
- [4] *Are JWST/NIRCam color gradients in the lensed $z = 2.3$ dusty star-forming galaxy El Anzuelo due to central dust attenuation or inside-out galaxy growth?*. 2023. Kamieneski, P., Frye, B., Pascale, M., Cohen, S., Windhorst, R., Jansen, R., Yun, M., Cheng, C., Summers, J., **Carleton, T.**, et al. ApJ, 955, 91
- [5] *Magellanic System Stars Identified in the SMACS J0723.3-7327 JWST ERO Images*. 2023. Summers, J., Windhorst, R., Cohen, S., Jansen, R., **Carleton, T.** et al. ApJ, 958, 108
- [6] *Searching for Intragroup Light in Deep U-band Imaging of the COSMOS Field*. 2023. McCabe, T., Redshaw, C., Otteson, L., Windhorst, R., Jansen, R., Cohen, S., **Carleton, T.**, et al. PASP, 135, 064101
- [7] *Dwarf galaxies show little ISM evolution from $z \sim 1$ to $z \sim 0$: A spectroscopic study of metallicity, star formation, and electron density*. 2023. Pharo, J.; Guo, Y.; Barro Calvo, G., Teppala, T., Bian, F., **Carleton, T.**, et al., ApJ, 959, 48
- [8] *JWST PEARLS. Prime Extragalactic Areas for Reionization and Lensing Science: Project Overview and First Results*. 2023. Windhorst, R., et al. AJ, 165, 13
- [9] *Testing Crowded Object Catalogs in the Hubble eXtreme Deep Field Mosaics to Study Sample Incompleteness from an Extragalactic Background Light Perspective*. 2022. Kramer, **Carleton, T.**, et al. ApJ, 940L, 15
- [10] *The GOGREEN survey: constraining the satellite quenching time-scale in massive clusters at $z > 1$* . 2022. Baxter, T., Cooper, M., Balogh, M., **Carleton, T.**, et al. MNRAS, 515, 5479
- [11] *Deep Large Binocular Camera r-band Observations of the GOODS-N Field*. 2022. Ashcraft, T., McCabe, T., Redshaw, C., Windhorst, R., Jansen, R., Cohen, S., **Carleton, T.**, et al. PASP 135, 1044
- [12] *The Dwarf Galaxy Population at $z \sim 0.7$: A Catalog of Emission Lines and Redshifts from Deep Keck Observations*. 2022. Pharo, J., Guo, Y., Calvo, G., **Carleton, T.**, et al. ApJS, 261, 12
- [13] *SKYSURF: Constraints on Zodiacal Light and Extragalactic Background Light through Panchromatic HST All-Sky Surface-Brightness Measurements: I. Survey Overview and Methods*. 2022. Windhorst, R., **Carleton, T.**, et al. AJ. 164, 141
- [14] *Seeing-Sorted Large Binocular Camera U-band Imaging of the Extended Groth Strip*. 2022. Redshaw, C., McCabe, T., Otteson, L., Windhorst, R., Jansen, R., Cohen, S., **Carleton, T.**, et al. RNAAS, 6, 63R

- [15] *Galaxy Science with ORCAS: Faint Star-Forming Clumps to $AB \leq 31$ mag and $r_e \geq 0.01''$* . 2021. Windhorst, R., **Carleton, T.**, et al. arXiv:2106.02664
- [14] *Implications of Increased Central Mass Surface Densities for the Quenching of Low-mass Galaxies*. 2021. Guo, Y., **Carleton, T.**, et al. ApJ, 914, 7G
- [16] *SED Analysis of 47 Spectroscopically Confirmed Galaxies at $z \simeq 6$ to Constrain Possible Relationships between UV Slope, Dust attenuation, and Escape Fraction*. 2020. Jeon, J., Windhorst, R., Cohen, S., Jansen, R., Smith, B., **Carleton, T.** et al. arXiv:2011.05918
- [17] *Astrophysical Tests of Dark Matter with Maunakea Spectroscopic Explorer*. 2019. Li, T., Kaplinghat, M., Bechtol, K., Bolton, A., Bovy, J., **Carleton, T.**, et al. arXiv:1903.03155
- [18] *Ground-based near-UV observations of 15 transiting exoplanets: constraints on their atmospheres and no evidence for asymmetrical transits*. 2016. Turner, J., **Carleton, T.**, et al. MNRAS, 459, 789
- [19] *Near-UV and optical observations of the transiting exoplanet TrES-3b*. 2013. Turner, J., Smart, B., Hardegree-Ullman, K., **Carleton, T.**, et al. MNRAS, 428, 678
- [20] *Variability of the blazar 4C 38.41 (B3 1633+382) from GHz frequencies to GeV energies*. 2012. Raiteri, C., et al. A&A, 545, A48
- [21] *The Unusual Variable Hot B Subdwarf LS IV-14°116*. 2011. Green, E. M., Guvenen, B., O'Malley, C, O'Connell, C., Baringer, B., Villareal, A. **Carleton, T.**, et al. ApJ, 734, 59
- [22] *C₆₀ in reflection nebulae*. 2010. Sellgren, K., Werner, M., Ingalls, J., Smith, J., **Carleton, T.**, et al. ApJL, 722, L54.