Timothy Carleton

Academic Positions

2020–Current **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 primarily interested in how galaxies evolve and how they are related to their dark-matter halos. Given recent observations highlighting their unusual properties, I am particularly interested in low-mass (dwarf) and diffuse galaxies. To study these objects, I use both observations (primarily utilizing data from the Hubble Space Telescope and James Webb Space Telescope) and simulations (primarily the Illustris-TNG cosmological simulation).

Approved Proposals and Awards

Proposals

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

2018 **Postdoctoral Travel Grant, University of Missouri**, $250.

2015–2017 **ARCS Scholar, University of California, Irvine**, $15,000.

Teaching/Mentoring

2020–2022 **Python in Astronomy**, *Arizona State Univeristy*.
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

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, 2017 **COSMOS Teaching Assistant**, *University of California, Irvine*.
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

Primary Mentor For

2022 **Isabel McIntyre**, *ASU Graduate Student*.

2020–2022 **Rosalia O'Brien**, *ASU Graduate Student*.

2020–2022 **Delondrae Carter**, *ASU Graduate Student*, Space Grant Intern, Graduate College IEF fellowship winner, Served on his Senior Thesis Committee.

2020–2022 **Jessica Berkheimer**, *ASU Undergraduate/Graduate Student*, Space Grant Intern, LEAP Scholar.

2020–2021 **Ci'mone Rogers**, *ASU Undergraduate*, Space Grant Intern.

2020–2022 **Zak Goisman**, *ASU Undergraduate*.

2021–2022 **Daniel Henningson**, *ASU Undergraduate*.

2020–2022 **Andi Swirbul**, *ASU Undergraduate*, Space Grant Intern.

2021–2022 **Hanga Andras-Letanovszky**, *UA Undergraduate*.

2021–2022 **Purvansh Bhati**, *BASIS High School Scottsdale*.

2020–2022 **Rushabh Pawnikar**, *BASIS High School Peoria*.

Secondary Mentor For

2021–2022 **Alex Pigarelli**, *ASU Graduate Student*.

2020–2022 **Scott Tompkins**, *ASU Undergraduate/UWA Graduate Student*.

2020–2022 **Darby Kramer**, *ASU Graduate Student*.

2020–2021 **Junehyoung Jeon**, *ASU Undergraduate/UT Graduate Student*.

2020 **Haley Abate**, *ASU Undergraduate Student.*

2020 **Teja Teppala**, *UM Graduate Student.*

2018–2020 **Sarah Parker**, *UM Graduate Student.*

2019 **Alec Martin**, *UM Undergraduate Student.*

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

Community Service

2022 **Primary Organizer**, *SESE Internal Symposium.*

2021 **Co-Organizer**, *First SESE Internal Symposium.*

2020–2022 **Co-Organizer**, *SESE Extragalactic Journal Club.*

2020–2021 **Member**, *SESE JEDI Task Force.*

2021 **Co-Organizer**, *SESE Summer Extragalactic Talk Series.*

Reviewer, *ApJ, NASA, MNRAS, PRL, NSF, Swinburne University.*

Volunteer, *St. Vincent de Paul Soup Kitchen.*

Selected Talks

[1] *Ultra-Diffuse Galaxies: Solutions and problems.* UC Santa Cruz: April 18, 2022, *Invited.*

[2] *First Results from the SKYSURF Project.* SphereX Team Meeting: May 24, 2022, *Invited.*

[3] *Ultra Diffuse Galaxies and the SKYSURF Project.* Swinburne University: Sept 1, 2021, *Invited.*

[4] *The SKYSURF Project Overview.* Macquarie University: Aug 13, 2020, *Invited.*

[5] *The formation of Ultra-diffuse galaxies through tidal heating.* STSCI Lunch Talk: Oct 4, 2019, *Invited.*

[6] *Evidence for Stochastic Quenching in Massive Galaxies at* $z \sim 1$. MARAC Meeting: April 12, 2019.

[7] *The Big Bang to the Periodic Table.* Nuclear Science & Engineering for Secondary Science Teachers: June 10, 2019.

[8] *The Origins of Ultra-Diffuse Galaxies.* CANDELS Meeting: October 24, 2018.

[9] *Tidally Disrupted Halos as the Hosts of Ultra-Diffuse Galaxies.* GalFRESCA: August 25, 2017.

[10] *Searching for Ultra-Diffuse Galaxies in the Bolshoi Simulation.* Santa Cruz Galaxy Workshop: August 10, 2017.

[11] *The CO-H2 Conversion Factor at $z < 1.5$.* Multi-Scale Star Formation Conference: April 5, 2017.

[12] *Star Formation in Young Galaxies.* ARCS Research Symposium: March 16, 2017.

[13] *The Sky Tonight.* ASUCI Student Night at the UCI Observatory: May 22, 2013.

[14] *Meteor Showers and Solar System Debris.* Perseid Meteor Shower Visitor Night at the UCI Observatory: August 11, 2013.

Publication List

Lead Author

[1] *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** et al. AJ, 164, 170.

[2] *An excess of globular clusters in Ultra-Diffuse Galaxies formed through tidal heating.* 2021. **Carleton** et al. MNRAS, 502, 394.

[3] *Evidence for Non-smooth Quenching in Massive Galaxies at $z \sim 1$.* 2019. **Carleton** et al. MNRAS, 491, 2822.

[4] *The Formation of Ultra Diffuse Galaxies in Cored Dark Matter Halos Through Tidal Stripping.* 2019. **Carleton** et al. MNRAS, 485, 382.

[5] *PHIBSS: exploring the dependence of the CO-H2 conversion factor on total mass surface density at $z < 1.5$.* 2017. **Carleton** et al. MNRAS, 476, 4886.

Student Papers

[1] *SKYSURF-4: Panchromatic Full Sky Surface Brightness Measurement Methods and Results.* 2022. O'Brien et al. arXiv:2210.08010.

[2] *Testing Crowded Object Catalogs in the Hubble eXtreme Deep Field Mosaics to Study Sample Incompleteness from an Extragalactic Background Light Perspective.* 2022. Kramer et al. arXiv:2208.07218.

[3] *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 et al. arXiv:2011.05918.

Contributing Author

[1] *The GOGREEN survey: constraining the satellite quenching time-scale in massive clusters at $z > 1$.* 2022. Baxter et al. MNRAS, 515, 5479.

[2] *Webb's PEARLS: Prime Extragalactic Areas for Reionization and Lensing Science: Project Overview and First Results.* 2022. Windhorst et al. arXiv:2209.04119.

[3] *Deep Large Binocular Camera r-band Observations of the GOODS-N Field.* 2022. Ashcraft et al. arXiv:2208.14572.

[4] *The Dwarf Galaxy Population at $z \sim 0.7$: A Catalog of Emission Lines and Redshifts from Deep Keck Observations.* 2022. Pharo et al. ApJS, 261, 12.

[5] *SKYSURF: Constraints on Zodiacal Light and Extragalactic Background Light through Panchromatic HST All-Sky Surface-Brightness Measurements: I. Survey Overview and Methods.* 2022. Windhorst et al. AJ. 164, 141.

[6] *Seeing-Sorted Large Binocular Camera U-band Imaging of the Extended Groth Strip.* 2022. Redshaw et al. 2022RNAAS, 6, 63R.

[7] *Galaxy Science with ORCAS: Faint Star-Forming Clumps to AB≤31 mag and $r_e \geq$ 0.01″.* 2021. Windhorst et al. arXiv:2106.02664.

[8] *Implications of Increased Central Mass Surface Densities for the Quenching of Low-mass Galaxies.* 2021. Guo et al. ApJ, 914, 7G.

[9] *Astrophysical Tests of Dark Matter with Maunakea Spectroscopic Explorer.* 2019. Li et al. arXiv:1903.03155.

[10] *Ground-based near-UV observations of 15 transiting exoplanets: constraints on their atmospheres and no evidence for asymmetrical transits.* 2016. Turner et al. MNRAS, 459, 789.

[11] *Near-UV and optical observations of the transiting exoplanet TrES-3b.* 2013. Turner et al. MNRAS, 428, 678.

[12] *Variability of the blazar 4C 38.41 (B3 1633+382) from GHz frequencies to GeV energies.* 2012. Raiteri et al. Astronomy and Astrophysics, 545, A48.

[13] *The Unusual Variable Hot B Subdwarf LS IV-14°116.* 2011. Green, E. M., et al. ApJ, 734, 59.

[14] *C_{60} in reflection nebulae.* 2010. Sellgren, K., et al. ApJ Letters, 722, L54..