

Olivia Rae Cooper

NSF FELLOW & ASTRONOMY PHD CANDIDATE

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Research Interests

Massive galaxy evolution at high redshift ($z > 3$); multi-wavelength observations of massive galaxies (including dusty star-forming galaxies, early quiescent galaxies, reionization era galaxies)

Education

The University of Texas at Austin

2020 - 2025 (expected)

PH.D. IN ASTRONOMY

GPA: 4.0/4.0

- Advisor: Prof. Caitlin Casey
- NSF Graduate Research Fellow
- Dissertation: *Bright and Early: The Role of Massive Galaxies in the Evolution of the $z > 3$ Universe*

Smith College

2016 - 2020

B.A. IN ASTRONOMY (HIGHEST HONORS) & IN PHYSICS

GPA: 3.9/4.0

- Advisor: Prof. James Lowenthal
- Concentration in Climate Change
- Senior Honors Thesis: *Tales From Our Dusty, Warped Past: Lensing Environments of Planck-Selected Submillimeter Galaxies Observed With Gemini*

Professional Appointments

- 2022-2025 **NSF Graduate Research Fellow**, UT Austin Astronomy Department
- 2021-2022 **Graduate Research Assistant**, UT Austin Astronomy Department
- 2020-2021 **Dean's Excellence Fellow**, UT Austin Astronomy Department
- 2019 **LIGO Summer Undergraduate Research Fellow**, Caltech LIGO Lab
- 2018 **Physics & Astronomy NSF REU Fellow**, University of Utah Physics & Astronomy Department
- 2018-2020 **Undergraduate Special Studies Researcher**, Smith College Astronomy Department
- 2017-2019 **Undergraduate Research Intern**, Merenlender Lab, UC Berkeley
- 2016-2018 **STRIDE Scholar**, Smith College Astronomy Department

Awards, Fellowships, & Honors

- 2023 **Professional Development Award**, UT Austin Graduate School
- 2022 **Frank N. Edmonds, Jr. Memorial Fellowship**, UT Austin Astronomy Dept
Board of Visitors 2nd Year Defense Award, UT Austin Astronomy Dept
OGS Summer Fellowship, UT Austin Graduate School
NSF Graduate Research Fellowship, National Science Foundation
- 2020 **Dean's Excellence Fellowship**, UT Austin College of Natural Sciences
Mary Dailey Irvine Prize, (for best astronomy thesis), Five College Astronomy Department
Excellence in Astronomy & Astrophysics, Smith College Astronomy Dept
Florence Augusta Merriam Bailey Prize, (environmental problem solving), Smith College
- 2019 **Goldwater Scholarship**, Barry M. Goldwater Foundation
Chambliss Student Award Honorable Mention, 233rd AAS Meeting

- 2018 **Grand Prize**, (selected for NSF REU Conference), University of Utah REU Symposium
Dean's List, Smith College
- 2017 **Dean's List**, Smith College

Publications

Statistics (as of 30 Jul 2023, source: Google Scholar)

[Link to ADS](#)

number of co-authored accepted refereed papers: 6

number of first-authored accepted refereed papers: 2

h-index: 4

†Denotes papers led by students under my supervision

REFEREED PUBLICATIONS

6. Champagne, J. B., Casey, C. M., Finkelstein, S. L., Bagley, M., **Cooper, O. R.**, Larson, R. L., Long, A. S., Wang, F. *A Mixture of LBG Overdensities in the Fields of Three $6 < z < 7$ Quasars: Implications for the Robustness of Photometric Selection*. 2023 ApJ 952, 99, [arXiv:2304.10437](#)
5. McKinney, J., Finnerty, L., Casey, C. M., Franco, M., Long, A. S., Fujimoto, S., Zavala, J. A., **Cooper, O. R.**, Akins, H., Pope, A., Armus, L., Soifer, B. T., Larson, K., Matthews, K., Melbourne, J., Cushing, M. *Broad Emission Lines in Optical Spectra of Hot, Dust-obscured Galaxies Can Contribute Significantly to JWST/NIRCam Photometry*. 2023 ApJ 946, 39, [arXiv:2301.00017](#)
4. **Cooper, O. R.**, Casey, C. M., Zavala, J. A., Champagne, J. B., da Cunha, E., Kartaltepe, J. S., Long, A. S., Spilker, J. S., Staguhn, J. *Searching far and long I: Pilot ALMA 2 mm follow-up of bright dusty galaxies as a redshift filter*. 2022 ApJ 930, 32, [arXiv:2203.14973](#)
3. Katz, M. L., **Cooper, O. R.**, Coughlin, M. W., Burdge, K. B., Breivik, K., Larson, S. L. *GPU-Accelerated Periodic Source Identification in Large-Scale Surveys: Measuring P and \dot{P}* . 2021 MNRAS 503, 2, [arXiv:2006.06866](#)
2. Ashok, A., Zasowski, G. Seth, A., Hasselquist, S., Bergsten, G., **Cooper, O.**, Boardman, N., Bizyaev, D., Goytia, S. M., García-Hernández, D. A., Roman-Lopes, A. *The APOGEE Library of Infrared SSP Templates (A-LIST): High-resolution Simple Stellar Population Spectral Models in the H Band*. 2021 AJ 161, 4, [arXiv:2012.15773](#)
1. **Cooper, O.**, Keeley, A., Merenlender, A. *Curriculum gaps for adult climate literacy*. 2019 Conservation Science and Practice, e102, <https://doi.org/10.1111/csp2.102>

PUBLICATIONS IN REVIEW

- Urbano Stawinski, S. M., Cooper, M. C., Finkelstein, S. L., Jung, I., Pérez-González, P. G., Casey, C. M., **Cooper, O. R.**, Hathi, N. P., Holwerda, B. W., Koekemoer, A. M., Fernández, V., Larson, R. L., Lucas, R. A., Yung, L. Y. A. *Deeper than DEEP: A Spectroscopic Survey of $z > 3$ Lyman- α Emitters in the Extended Groth Strip*. Submitted to MNRAS, [arXiv:2307.04782](#)
- Long, A. S., Antwi-Danso, J., and 31 other authors including **Cooper, O. R.** *Efficient NIRCam Selection of Quiescent Galaxies at $3 < z < 6$ in CEERS*. Submitted to ApJ, [arXiv:2305.04662](#)
- Akins, H. B., Casey, C. M., and 57 other authors including **Cooper, O. R.** *Two massive, compact, and dust-obscured candidate $z \sim 8$ galaxies discovered by JWST*. Submitted to ApJ, [arXiv:2304.12347](#)
- McKinney, J., Manning, S. M., **Cooper, O. R.**, and 32 other authors. *A Near-Infrared Faint, Far-Infrared-Luminous Dusty Galaxy at $z \sim 5$ in COSMOS-Web*. Submitted to ApJ, [arXiv:2304.07316](#)
- Jung, I., Finkelstein, S. L., and 30 other authors including **Cooper, O. R.** *CEERS: Diversity of Lyman-Alpha Emitters during the Epoch of Reionization*. Submitted to ApJ, [arXiv:2304.05385](#)
- Kamieneski, P. S., Yun, M. S., Harrington, K. C., Lowenthal, J. D., Wang, Q. D., Frye, B. L., Jimenez-Andrade, E. F., Vishwas, A., **Cooper, O.**, Pascale, M., Foo, N., Berman, D., Englert, A., Garcia Diaz, C. *PASSAGES: the wide-ranging, extreme intrinsic properties of Planck-selected, lensed dusty star-forming galaxies*. Submitted to ApJ, [arXiv:2301.09746](#)
- Casey, C. M., Kartaltepe, J. S., and 83 other authors including **Cooper, O. R.** *COSMOS-Web: An Overview of the JWST Cosmic Origins Survey*. Submitted to ApJ, [arXiv:2211.07865](#)
- Fujimoto, S., Finkelstein, S. L., and 50 other authors including **Cooper, O. R.** *ALMA FIR View of Ultra High-redshift Galaxy Candidates at $z \sim 11-17$: Blue Monsters or Low- z Red Interlopers?*. Submitted to ApJ, [arXiv:2211.03896](#)

Long, A. S., Casey, C. M., Lagos, C. P., Lambrides, E. L., Zavala, J. A., Champagne, J., **Cooper, O. R.**, Cooray, A. R. *Missing Giants: Predictions on Dust-Obscured Galaxy Stellar Mass Assembly Throughout Cosmic Time*. Submitted to ApJ, [arXiv:2211.02072](#)

NON-REFEREED PUBLICATIONS

†Magee, J., Casey, C. M., **Cooper, O. R.**, Melendez, A., Fong, M., Karlataltepe, J., Long, A. S., Stawinski, S. U., Champagne, J. B., Cooper, M. C., Faisst, A. L., Maraston, C., and The WERLS Collaboration *Rotation Curve Measurement of Dark Matter Content of a $z \sim 0.5$ Galaxy*. 2023 RNAAS 7, 110, [RNAAS](#)

Invited & Contributed Talks

INVITED SCIENCE TALKS

- 22 Nov **First Results from WERLS: Tracing Ionized Bubbles with Keck and JWST**, Extragalactic Seminar, Cornell
2022 Astronomy Dept, Ithaca, NY (*virtual*)
- 07 Nov **First Results from WERLS: Tracing Ionized Bubbles with Keck and JWST**, Lunch Seminar, New Mexico State
2022 University Astronomy Dept, Las Cruces, NM
- 15 Feb **Searching Far and Long: ALMA 2mm Follow-up of Bright Dusty Galaxies as a Redshift Filter**, Student
2022 Seminar, Parsec Institute at University of Montreal, Montreal, Canada (*virtual*)
- 20 Jan **Searching Far and Long: ALMA 2mm Follow-up of Bright Dusty Galaxies as a Redshift Filter**, CosmoFREDIE
2022 Seminar, Institute for Astronomy, University of Hawaii, Honolulu, HI

CONTRIBUTED SCIENCE TALKS & POSTERS

- 12 Jun **First Results from WERLS: Tracing Ionized Bubbles with Keck and JWST**, First Light, Massachusetts Institute of
2023 Technology, Cambridge, MA
- 25 May **Searching Far and Long: Bright 2mm-detected galaxies with (and without) JWST counterparts**, COSMOS
2023 Team Meeting 2023, RIT, Rochester, NY
- 10 May **First Results from WERLS: Tracing Ionized Bubbles with Keck and JWST**, CEERS Team Meeting 2023, UT
2023 Austin, Austin, TX
- 14 Nov **First Results from WERLS: Tracing Ionized Bubbles with Keck and JWST**, Extragalactic Seminar, UT Austin
2022 Astronomy Dept, Austin, TX
- 12 Jul **Bright and Early: Efficient Identification of Massive Galaxies at $z > 4$** , COSMOS 2022 Meeting, Institut
2022 d'Astrophysique de Paris, Paris, France
- 14 Apr **Taking census of the extreme in the early Universe: Massive galaxy evolution at $z \sim 3 - 6$** , Cosmos Seminar,
2022 UT Austin Astronomy Dept, Austin, TX
- 26 Apr **Dusty needles in a haystack: 2mm survey of DSFGs in SSA22**, Extragalactic Seminar, UT Austin Astronomy
2021 Dept, Austin, TX

INVITED PUBLIC & OUTREACH TALKS

- 25 Feb **A Wide View of the First Two Billion Years with COSMOS-Web**, UT Austin Astronomy Dept Board of Visitors
2023 Meeting, Austin, TX

INVITED PROFESSIONAL DEVELOPMENT PRESENTATIONS

- 24 Jul **NSF Graduate Research Fellowship Panel**, Astronomy NSF REU Seminar, UT Austin Astronomy Department,
2023 Austin, TX
- 22 Sep **How to read science papers: An Astrobites perspective**, Writing about Astronomy course, UMass Amherst
2021 Astronomy Department, Amherst, MA (*virtual*)

Observing & Grants

AWARDED TIME (PI)

VIRUS, Hobby-Eberly Telescope (2022-3) <i>Extending a complete census of Lyman-α Emitters in the SSA22 Protocluster at $z = 3.1$</i>	10 hr
GNRIS, Gemini North (2022A) <i>Spectroscopic determination of the relationship between a luminous X-ray AGN and a strongly lensed HyLIRG at $z = 3.55$</i>	3.8 hr
VIRUS, Hobby-Eberly Telescope (2022-2) <i>Extending a complete census of Lyman-α Emitters in the SSA22 Protocluster at $z = 3.1$</i>	7 hr
Atacama Large Millimeter/submillimeter Array (Cycle 8) <i>Needle in a haystack: Identifying the highest-redshift candidate DSFGs using 2mm imaging</i>	9 hr
GMOS imaging, Gemini South (2021B) <i>Comprehensive Lens Characterization for a Hyperluminous DSFG at $z = 2$</i>	1.25 hr
Triple Spec, Palomar Observatory P200 Telescope (Summer 2019) <i>Phase-resolved spectroscopy of ultra-compact binaries as candidate LISA verification sources</i>	1 half night

AWARDED TIME (CONTRIBUTING CO-I, SELECTED)

MOSFIRE+LRIS, NASA Keck Key Strategic Mission Support (2022A–2023B) PIs: C. Casey & J. Kartaltepe <i>Web Epoch of Reionization Lyman-α Survey (WERLS)</i>	29 nights
NIRCam+MIRI, JWST (Cycle 1) PIs: C. Casey & J. Kartaltepe <i>COSMOS-Web: The JWST Cosmic Origins Survey</i>	254 hours

OBSERVING EXPERIENCE

LRIS, Keck I (remote, 6 nights)	2022A, 2022B, 2023A
MOSFIRE, Keck I (local/remote, 5 nights)	2022A
WIYN 2.1 m Telescope, Kitt Peak National Observatory (remote)	Jul-Aug 2019
Triple Spec on P200 Telescope, Palomar Observatory (local)	Aug 13, 2019
WIYN 0.9 m Telescope, Kitt Peak National Observatory (local)	Jan 14-19, 2019
16" Telescope, Smith College McConnell Observatory (local)	Fall 2016-Spring 2020

GRANTS

NRAO Student Observing Support Grant, Cycle 8 <i>Advising PI: C. Casey</i>	\$28,143
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Mentorship & Teaching

MENTORSHIP

Postbac	Jake Magee , Post-bac & previous undergrad, UT Austin. (<i>co-advising with Prof. Casey</i>)	2023-now
Undergrad	Jake Magee , Undergrad, UT Austin. (<i>co-advised with Prof. Casey</i>)	2022-2023
(research)	Mia Fong , Undergrad, UT Austin. (<i>co-advised with Prof. Casey</i>)	2022-2023
	Alfonso Melendez , TAURUS Scholar & undergrad, UT Austin. (<i>co-advised with Prof. Casey</i>)	2022-2023
Undergrad	Courtney Reed , TAURUS Scholar, UT Austin	2022
(informal)	Ian Wolter , TAURUS Scholar, UT Austin	2022
	Marie Barry , TAURUS Scholar, UT Austin	2021
	Jennifer Poppe , Undergrad, UT Austin	2021-present

TEACHING

Jan 2018 - **AST 100 & 113 Teaching Assistant (Smith College)**, tutor STEM and non-STEM undergraduates in astronomy
 May 2019 courses, administer and evaluate constellation identification and telescope operation quizzes

Outreach, Interviews, & Press

CONTINUED OUTREACH

Astrobits Collaboration

2021-present

[ASTROBITES.ORG/AUTHOR/OCOOPER](https://astrobits.org/author/ocooper)

- *Climate Change Committee Co-Chair (2021-present)*: co-founded committee to establish conversations and engagement at the interface of astronomy and climate advocacy; facilitate series of climate+astro related posts and host our annual Earth Week x Astrobits virtual, global event
- *Author (2021-2023)*: wrote undergraduate-level summaries of astronomy papers for Astrobits website; published 21 articles over two-year regular author rotation

COSMOS-Web Outreach Committee Co-Chair

2022-present

[COSMOS.ASTRO.CALTECH.EDU/PAGE/COSMOSWEB](https://cosmos.astro.caltech.edu/page/cosmosweb)

- *Outreach Committee Co-Chair (2022-present)*: founding co-chair of Outreach Committee; facilitate international group of astronomers interested in engaging the public in COSMOS-Web science and building accessibility of our science products for astronomers outside of the collaboration

SCIENCE WRITING (SELECTED)

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| O. Cooper. "Climate change and space debris, a vicious cycle." Astrobits. | 2023 Jan 20 |
| O. Cooper. "Can you explain these long dark gaps in your cosmological resume?" Astrobits. | 2022 May 16 |
| O. Cooper. "A serving of X-rays in a stack of galaxies." Astrobits. | 2022 Mar 22 |
| O. Cooper. "Rethinking the science conference format." Astrobits. | 2022 Jan 10 |
| O. Cooper. "Replacing our constellations with satellites." Astrobits. | 2021 Sep 10 |
| O. Cooper. "Blazing Hot DOGs at the Cosmic BBQ." Astrobits. | 2021 Jul 21 |
| O. Cooper. "Gotta catch 'em all: the first neutron star-black hole merger detection!" | 2021 Jun 30 |
| O. Cooper. "Teaching Change: The Importance of Climate Communication." SPS Observer | 2020 Spring |

MEDIA APPEARANCES & INTERVIEWS

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| Point of Discovery, UT Austin College of Natural Sciences (podcast): "Right Place, Right Time" | 2022 Dec 13 |
| Astronomy on Tap Jena (vodcast): "Did early galaxies go through climate change?" | 2022 Nov 8 |

Service & Leadership

LEADERSHIP ROLES

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| 2022 - now | COSMOS-Web Outreach Committee Chair , organize and manage outreach, informal publication, social media, education, and citizen science efforts from the COSMOS-Web team |
| 2022 - 2023 | Graduate Student Representative , serve as grad student liaison for dept, attend faculty meetings, host town halls, facilitate dept journal club, organize dept social events, serve on DEI & grad admissions committees |
| 2021 - now | Astrobits Climate Change Committee Chair , founder and co-chair for climate change committee within Astrobits, post ~1 climate/astro related post per month, host special Earth Week programming annually |
| 2021 - 2022 | TAURUS+REU Social Event Coordinator , organize social events for the summer scholars in the NSF REU & TAURUS program and the graduate students, planned average one event per week for 10 weeks each summer |

REFEREEING & REVIEWS

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| External Reviewer for Canadian Time Allocation Committee | 2022 |
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