

OLIVIA RAE COOPER

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EDUCATION

University of Texas at Austin

2020 - present

Astronomy Graduate Student

Smith College

May 2020

B.A. in Astronomy (Highest Honors) and Physics, Concentration in Climate Change GPA: 3.9/4.0

Senior Honors Thesis: *Tales From Our Dusty, Warped Past: Lensing Environments of Planck-Selected Submillimeter Galaxies Observed With Gemini*

RESEARCH EXPERIENCE

Gravitationally Lensed Submillimeter Galaxies

Sept 2018 - May 2020

Smith College Honors Thesis/Special Studies, Advisor: Prof. James Lowenthal

- reduce and analyze Gemini photometry of Planck selected gravitationally lensed submm galaxies
- design multi-object slit masks for our target fields to collect Gemini spectra
- measure photo-z's of objects in target fields to constrain foreground lens mass distribution

Observing and Modeling Ultracompact Binaries

June 2019 - Aug 2019

Caltech LIGO SURF, Advisors: Dr. Michael Coughlin, Shreya Anand

- simulate light curves of inspiraling eclipsing binaries with orbital decay
- period search and scan for potential verification binaries for Laser Interferometer Space Antenna
- collect and analyze light curves and spectra of potential ultracompact verification binaries

Comparing Rotation of Low Mass Stars

Jan 2019 - May 2019

Five College Astronomy Department, Advisor: Dr. Kim Ward Duong

- observe low mass stars with the WIYN 0.9 m telescope at Kitt Peak
- collect, reduce, and analyze time domain differential photometry
- interpret and compare light curves of low mass stars in clusters (Coma Ber and IC348)

Chemodynamics of Complex Stellar Populations in M31

June 2018 - Jan 2019

University of Utah Physics & Astronomy REU, Advisors: Prof. Anil Seth, Prof. Gail Zasowski

- analyze high resolution infrared spectroscopy data with Python
- fit single star templates to integrated light spectra from M31 to measure kinematics
- map radial velocity and velocity dispersion for the central region of M31

Climate Literacy and Curriculum Gaps

Dec 2017 - Aug 2019

Merender Lab Research Intern, Advisor: Prof. Adina Merender

- collect and analyze climate science syllabi content from undergraduate courses
- extract and process word count and z-score data from syllabi
- code climate syllabi data in an Excel spreadsheet and graph the consolidated data

Transit Photometry of K2 and TESS Exoplanet Candidates

Sept 2016 - present

Smith College STRIDE/Special Studies Researcher, Advisor: Prof. James Lowenthal

- follow up on K2 and TESS exoplanet candidates
- observe exoplanet transits with Smith's 16 telescope and CCD

- reduce time domain photometry and create light curves using AstroImageJ

PUBLICATIONS

Journal Publications

1. Katz, M. L., Cooper, O. R., Coughlin, M. W., Burdge, K., Breivik, K., Larson, S. *GPU-Accelerated Periodic Source Identification in Large-Scale Surveys: Measuring P and \dot{P}* (submitted)
2. Cooper O, Keeley A, Merenlender A. *Curriculum gaps for adult climate literacy*. Conservation Science and Practice. 2019; e102. <https://doi.org/10.1111/csp2.102>

Technical Reports

Observing and Modeling Ultracompact Binaries Detectable by LISA, technical final paper published on LIGO DCC: LIGO-T1900360-v1

Dissecting the Chemodynamics of Stellar Populations in M31 with APOGEE-2, formal final report submitted to University of Utah REU

Selected Abstracts & Proceedings

Lensing Masses of 8 Planck-selected Gravitationally Lensed Sub-millimeter Galaxies. Poster session at: American Astronomical Society 235th Winter Meeting; 2020 January 5; Honolulu, HI.

Observing and Modeling Ultracompact Binaries Detectable by LISA. Presentation at: LIGO SURF Summer Symposium; 2019 August 23; Pasadena, CA.

Tales from our Dusty, Warped Past: Investigating Gravitationally Lensed Sub-millimeter Galaxies. Poster session at: Smith College's Celebrating Collaborations; 2019 April 20; Northampton, MA.

Comparing Rotation of Low Mass Stars in Coma Berenices and IC 348. Poster session at: Five College Astronomy Department Spring Symposium; 2019 May 3; Amherst, MA.

Follow-up Transit Photometry of K2 and TESS Exoplanet Candidates. Poster session at: Smith College's Celebrating Collaborations; 2019 April 20; Northampton, MA.

Dissecting the Chemodynamics of Stellar Populations in M31 with APOGEE-2. Poster session at: American Astronomical Society 233rd Winter Meeting; 2019 January 8; Seattle, WA.

Dissecting the Motions of Stellar Populations in M31. Poster session at: NSF REU Symposium; 2018 October 28-29; Washington D.C.

Chemodynamics of Stellar Populations in M31. Poster session at: University of Utah Summer Symposium; 2018 August 2; Salt Lake City, UT.

Observations of Transiting Exoplanets. Poster session at: Smith College's Celebrating Collaborations; 2017 April 22; Northampton, MA.

AWARDS

Dean's Excellence Fellowship , <i>UT Austin College of Natural Sciences</i>	2020
Mary Dailey Irvine Prize (for an astronomy thesis), <i>Five College Astronomy Department</i>	2020
Astronomy Dep't Prize for Excellence in Astronomy & Astrophysics , <i>Smith College</i>	2020
Florence Augusta Merriam Bailey Prize (for environmental problem solving), <i>Smith College</i>	2020
LIGO Summer Undergraduate Research Fellowship , <i>Caltech LIGO Lab</i>	2019
Goldwater Scholarship , <i>Barry M. Goldwater Foundation</i>	2019
Chambliss Student Award Honorable Mention , <i>233rd AAS Meeting</i>	2019
Grand Prize (selected for NSF REU Conference), <i>University of Utah REU Symposium</i>	2018

Physics & Astronomy NSF REU Fellowship, *University of Utah*
Dean's List, *Smith College*
STRIDE Scholar, *Smith College*

2018
2016-17, 2017-18
2016-18

OBSERVATIONS

Awarded Time

Gemini GMOS-S imaging and multi-object spectra, 18 hours (Co-I, PI: J. Lowenthal)
Triple Spec on P200 Telescope, 1 half-night (PI)

Observing Experience

WIYN 2.1 m Telescope, Kitt Peak National Observatory (remote) July-August 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-present

COMPUTER SKILLS

Programs & Languages: python, Matlab, Mathematica, Unix, IRAF/pyRAF

Software: git, L^AT_EX, Microsoft Office, AstroImageJ, JSkyCalc, LoggerPro, Adobe Photoshop, DS9, Gemini DRAGONS, Aquamacs/emacs, EAZY photo-z, nway, SExtractor

SERVICE & OUTREACH

Climate Change and Human Health Outreach: created and executed outreach program in my hometown (Willits, CA) at the local hospital and school to raise awareness about how climate change affects our health, specifically in the context of recent wildfires

Climate Migration in the Northern Hilltowns: conducted interviews and compiled GIS data to support rural towns in Western MA as they apply for state Municipality Vulnerability Program grants

Maria Mitchell Women in STEM Symposium Notetaker: took notes at salon-style discussions regarding the experience of women in STEM and problem solving for the future

Light Pollution Awareness Exhibit: created and presented a slideshow of astrophotography at Smith College Concinnity Fest to raise awareness about light pollution

Star Parties: host public star parties at Smith College's observatory and use 16 telescope and eyepiece to look at and describe astronomical objects

RELEVANT WORK EXPERIENCE

Physics 117 Grader, *Smith College Physics Department* Sept 2018-Dec 2018
Grade homework for introductory physics class

Astronomy TA, *Smith College Astronomy Department* Jan 2018 - present
Tutor STEM and non-STEM undergraduates in astronomy courses,
administer and evaluate constellation identification and telescope operation quizzes

PROFESSIONAL MEMBERSHIPS

American Association for the Advancement of Science member May 2020 - present
Elected Sigma Xi May 2020 - present
American Astronomical Society member Sept 2018 - present
American Physical Society member June 2019 - present