

Dr. Meredith L. Rawls

Stellar Astronomer & Software Developer

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education

2016	Ph.D. Astronomy <i>Red Giants in Eclipsing Binaries as a Benchmark for Asteroseismology</i>	New Mexico State University, Las Cruces NM
2010	M.S. Astronomy <i>Refined Neutron Star Mass Determinations for Six Eclipsing X-Ray Pulsar Binaries</i>	San Diego State University, San Diego CA
2008	B.S. Physics (Emphasis in Astrophysics) Music humanities concentration; Semester abroad in Moscow, Russia	Harvey Mudd College, Claremont CA

employment

2016–Now	UW Department of Astronomy <i>LSST Data Management Postdoctoral Research Associate</i> <ul style="list-style-type: none">• Prompt image processing in python for the LSST Science Pipelines (80%)• Continuing research in stellar astrophysics (20%)	Seattle, Washington
2010–2016	NMSU Department of Astronomy <i>Research Associate</i> <ul style="list-style-type: none">• Observed and modeled red giant binaries as a window to stellar physics• Trained and certified observer at Apache Point Observatory <i>Teaching Assistant</i> <ul style="list-style-type: none">• Prepared, taught, and graded intro astronomy laboratory exercises• Piloted an online distance-learning lab (astronomy.nmsu.edu/geas)	Las Cruces, New Mexico
2011	Indian Institute of Astrophysics <i>Research Assistant</i> - Derived orbital solutions for eclipsing binaries in the LMC	Bangalore, India
2008–2010	SDSU Department of Astronomy <i>Research Assistant</i> - Neutron star masses from binary observations and models <i>Teaching Associate</i> - Intro labs, field trips, planetarium, and lab manual revision	San Diego, California
2007	Carnegie Observatories <i>Research Assistant</i> - Giant star chemical tagging & two observing runs at LCO	Pasadena, California

achievements

2019–Now	LSST Science Pipelines Workshops Instructor and helper for LSST software tutorial sessions at conferences	Large Synoptic Survey Telescope
2018–Now	Analysis of Precursor LSST Images Connecting each step of the Prompt Processing Pipeline, running real images from precursor surveys through it, and preparing for LSST Alert Production	LSST Science Pipelines, pipelines.lsst.io
2018	Pre-MAP Project Mentor Co-mentored two undergrads on a project using Zwicky Transient Facility data	University of Washington
2018	Implemented DECam Crosstalk Correction Added feature to remove linear inter-CCD crosstalk from the DECam instrument during the instrument signature removal (ISR) image processing step	LSST Science Pipelines, pipelines.lsst.io
2017–Now	Software Carpentry Instructor Certified instructor for introductory scientific computing (bash, git, python) Teaching regular workshops at UW eScience and beyond	The Carpentries, carpentries.org
2016–2017	Student Advisor Primary mentor and scientific resource for a post-baccalaureate astronomer	SDSS FAST / New Mexico State University

awards

2017–Now	DIRAC Fellow	DIRAC Institute, University of Washington
	Appointed to postdoctoral fellow in the new UW Astronomy DIRAC Institute	
2016	Postdoc Poster Award Winner	Cool Stars 19 SOC
	Awarded a plenary talk for best poster at the Cool Stars 19 conference	
2015	Chambliss Astronomy Achievement Student Award	American Astronomical Society
	Honorable Mention at the 225th AAS Meeting	
2012, 2013	Graduate Fellowship	New Mexico Space Grant Consortium
	Two-time recipient of the NM Space Grant Graduate Research Fellowship	
2009	Graduate Fellowship	Department of Astronomy, San Diego State University
	Ruth and Clifford Smith Astronomy Fellowship	

engagement

2019	ComSciCon-AAS Organizer	St. Louis, MO
	Science communication workshop held during the 234th AAS meeting	
	Member of Organizing Committee for two-day event in June 2019	
2018–2019	DIRAC Visitor's Committee	DIRAC Institute, University of Washington
	Established new monthly seminar series and recruited a diverse set of speakers	
2016–2017	ComSciCon-PNW Chair	comscicon.com/comscicon-pnw2017 , Seattle, WA
	Regional science communication conference for 40 STEM grad students	
	Chair of Organizing Committee for two-day event in March 2017	
2015	Inclusive Astronomy Conference	Vanderbilt University, Nashville, TN
	Helped draft the Nashville Recommendations to break down barriers to access	
2015	AAS Media Intern	American Astronomical Society
	Press representative and Astrobites live-blogger for the 225th AAS Meeting	
2014	SciCoder Workshop	NYU, New York City, NY
	Gained proficiency with python, git, SQLite, and other computing tools	
2013–2018	Science Writer and Editor	Astrobites Collaboration, astrobites.com
	Astrobites blog: daily summaries of recent research papers in astronomy	
	Spearheaded website redesign (2015), Social Media Czar (2016–2018)	
2013	Astronomy Ambassador	American Astronomical Society & Astronomical Society of the Pacific
	Trained in effective techniques to teach scientific concepts to varied audiences	
2008–Now	Public Outreach	Various locations
	Star parties, eclipse viewing events, open houses, school visits, field trips, planetarium shows, convention panels, science fairs, hands-on experiments	

publications

An Overview of the LSST Image Processing Pipelines

Bosch, J., [24 alphabetized co-authors], **M. L. Rawls**, [8 alphabetized co-authors]
2018, ADASS XXVIII Proceedings, arXiv:1812.03248

DMTN-039: A Prototype Alert Production Pipeline

M. L. Rawls

2017, LSST Data Management Technical Note, dmtn-039.lsst.io

Testing the Asteroseismic Scaling Relations for Red Giants with Eclipsing Binaries

Observed by Kepler

P. Gaulme, J. McKeever, J. Jackiewicz, **M. L. Rawls**, et al.

2016, The Astrophysical Journal, 832, 121

Red Giants in Eclipsing Binaries as a Benchmark for Asteroseismology

M. L. Rawls

2016, PhD Thesis, doi:[10.5281/zenodo.50996](https://doi.org/10.5281/zenodo.50996)

Committee: J. Jackiewicz (chair), L. Boucheron, P. Gaulme, T. Harrison, & R. Walterbos

KIC 9246715: The Double Red Giant Eclipsing Binary With Odd Oscillations

M. L. Rawls, P. Gaulme, J. McKeever, et al.

2016, *The Astrophysical Journal*, 818, 108

Red Giants in Eclipsing Binary and Multiple-Star Systems: Modeling and Asteroseismic Analysis of 70 Candidates from Kepler Data

P. Gaulme, J. McKeever, **M. L. Rawls**, et al.

2013, *The Astrophysical Journal*, 767, 82

Refined Neutron Star Mass Determinations for Six Eclipsing X-Ray Pulsar Binaries

M. L. Rawls, J. A. Orosz, J. E. McClintock, et al.

2011, *The Astrophysical Journal*, 730, 25

select presentations

(t) = talk

(p) = poster

(p) Real Time Image Differencing with the LSST Alert Production Pipeline

2019 January, 233rd AAS Meeting, #363.25, doi:[10.5281/zenodo.2543927](https://doi.org/10.5281/zenodo.2543927)

(t) Welcome and LSST Alert Production Overview

2018 May, DIRAC Inaugural Open House, *Invited Speaker*

(t) Red Giant Binaries Inside and Out with Asteroseismology

2018 January, Everett Astronomical Society, *Invited Speaker*

(t) Alert Production Pipeline Verification

2017 August, UW LSST Lunch Talk

(t) Weighing Stars with Starquakes

2017 July, Astronomy on Tap Seattle, *Invited Speaker*

(t) From Standalone Scripts to Software Development

2017 May, Python in Astronomy, Leiden, Netherlands

(t) Eclipsing Binaries as Astrophysical Laboratories

2017 February, WWU Department of Physics and Astronomy Colloquium, *Invited Speaker*

(t) A High Resolution Movie of the Night Sky with LSST

2017 February, University of British Columbia, *Invited Speaker*

(t) Testing Red Giant Asteroseismology with Eclipsing Binaries

2016 December, University of Victoria, *Invited Speaker*

(t) The Large Synoptic Survey Telescope: From Software to Science

2016 December, Herzberg Institute of Astrophysics, *Invited Speaker*

(t) The Odd Oscillatory Behavior of Red Giant Binaries

2016 November, Harvard CfA Stars & Planets Seminar, *Invited Speaker*

(t) Big Software for Big Data: Scaling Up Photometry for LSST

2016 November, 105th Meeting of the AAVSO, *Invited Speaker*

(t) The Large Synoptic Survey Telescope: Status and Opportunities

2016 October, Northwest Astronomers Meeting, *Invited Speaker*

(p) Red Giant Eclipsing Binaries: Exploring Non-Oscillators and Testing Asteroseismic Scalings

2016 June, Cool Stars 19, Postdoc Poster Award Winner, doi:[10.5281/zenodo.58046](https://doi.org/10.5281/zenodo.58046)

(t) Red Giants in Eclipsing Binaries as a Benchmark for Asteroseismology

2016 April, NMSU Department of Astronomy Colloquium, PhD Thesis Defense

- (t) What Makes Red Giants Tick? Linking Tides, Activity, & Solar-Like Oscillations via Eclipsing Binaries
2016 January, 227th AAS Meeting, #105.06D
- (t) Testing Asteroseismology with Red Giants in Eclipsing Binaries
2015 September, University of Washington Astro Lunch, *Invited Speaker*
- (p) The Double Red Giant Binary With Odd Oscillations
2015 January, 225th AAS Meeting, #345.16, Chambliss Honorable Mention
- (t) Red Giants in Eclipsing Binaries as a Benchmark for Asteroseismology
2014 February, NMSU Department of Astronomy Colloquium, PhD Thesis Proposal
- (t) A Tale of Two Red Giants: Testing Asteroseismic Scaling Relations with KIC 9246715
2014 January, 223rd AAS Meeting, #405.04
- (t) Red Giants in Eclipsing Binaries: Kepler Light Curves, Radial Velocities, & Asteroseismology
2013 July, Giants of Eclipse, 40302
- (p) Red Giants in Eclipsing Binaries: First Look at Kepler Light Curves
2013 January, 221st AAS Meeting, #142.16
- (t) Light Curve Solutions for Eclipsing Binaries in the LMC
2011 August, Indian Institute of Astrophysics Colloquium, Bangalore
- (t) Refined Neutron Star Mass Determinations in Six Eclipsing X-Ray Pulsar Binaries
2010 April, SDSU Department of Astronomy Colloquium, Master's Thesis Defense