Dr. Meredith L. Rawls

Stellar Astronomer & Software Developer

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education

2016 **Ph.D.** Astronomy — New Mexico State University, Las Cruces NM
Red Giants in Eclipsing Binaries as a Benchmark for Asteroseismology

2010 **M.S.** Astronomy — San Diego State University, San Diego CA
Refined Neutron Star Mass Determinations for Six Eclipsing X-Ray Pulsar Binaries

2008 **B.S.** Physics (Emphasis in Astrophysics) — Harvey Mudd College, Claremont CA
Music humanities concentration; Semester abroad in Moscow, Russia

employment

2016–Now **LSST Data Management, UW Department of Astronomy** — Seattle, Washington
2019–Now *Research Scientist*
2016–2019 *Postdoctoral Research Associate*
- Prompt image processing in python for the LSST Science Pipelines (80%)
- Continuing research in stellar astrophysics (20%)

2010–2016 **NMSU Department of Astronomy** — Las Cruces, New Mexico
Research Associate
- Observed and modeled red giant binaries as a window to stellar physics
- Trained and certified observer at Apache Point Observatory

Teaching Assistant
- Prepared, taught, and graded intro astronomy laboratory exercises
- Piloted an online distance-learning lab (astronomy.nmsu.edu/geas)

2011 **Indian Institute of Astrophysics** — Bangalore, India
Research Assistant - Derived orbital solutions for eclipsing binaries in the LMC

2008–2010 **SDSU Department of Astronomy** — San Diego, California
Research Assistant - Neutron star masses from binary observations and models
Teaching Associate - Intro labs, field trips, planetarium, and lab manual revision

2007 **Carnegie Observatories** — Pasadena, California
Research Assistant - Giant star chemical tagging & two observing runs at LCO

achievements

2019–Now **LSST Science Pipelines Workshops** — Large Synoptic Survey Telescope
Instructor and helper for LSST software tutorial sessions at conferences

2018–Now **Analysis of Precursor LSST Images** — LSST Science Pipelines, pipelines.lsst.io
Connecting each step of the Prompt Processing Pipeline, running real images from precursor surveys through it, and preparing for LSST Alert Production

2018 **Pre-MAP Project Mentor** — University of Washington
Co-mentored two undergrads on a project using Zwicky Transient Facility data

2017–Now **Software Carpentry Instructor** — The Carpentries, carpentries.org
Certified instructor for introductory scientific computing (bash, git, python)
Teaching regular workshops at UW eScience and beyond

2016–2017 **Student Advisor** — SDSS FAST / New Mexico State University
Primary mentor and scientific resource for a post-baccalaureate astronomer

awards

2017–Now **Invited to join DIRAC as a Research Fellow** — Department of Astronomy, UW
Data Intensive Research in Astrophysics & Cosmology (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

2018–Now **DIRAC Visitor's Committee** — DIRAC Institute, UW
Established new monthly seminar series and recruited a diverse set of speakers

2018–2019 **UAW Local 4121 Postdoctoral Unit Area Steward** — Department of Astronomy, UW
Lead department organizer and liaison; advocate for family & childcare issues

2016–2017 **ComSciCon-PNW Chair** — comscicon.com/comscicon-pnw2017, Seattle
Chair of OC for science communication conference for 40 STEM grad students

2015 **Inclusive Astronomy Conference** — Vanderbilt University, Nashville
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
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

APOGEE/*Kepler* Overlap Yields Orbital Solutions for a Variety of Eclipsing Binaries
J. M. Clark Cunningham, **M. L. Rawls**, D. Windemuth, A. Ali, et al.
2019, The Astronomical Journal, 158, 106

An Overview of the LSST Image Processing Pipelines
J. Bosch, [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
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

(t) The Software Behind LSST's Time Domain Science
2019 August, Vanderbilt Seminar, *Invited Speaker*

(t) DIA Processing, Testing, and Development: Finding Real Bumps in the Night
2019 August, LSST Project & Community Workshop, *Invited Speaker*

(p) Real Time Image Differencing with the LSST Alert Production Pipeline
2019 January, 233rd AAS Meeting, #363.25, doi: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 Astonomical Society, *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) 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) 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

(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) Refined Neutron Star Mass Determinations in Six Eclipsing X-Ray Pulsar Binaries
2010 April, SDSU Department of Astronomy Colloquium, Master's Thesis Defense