

Dr. Meredith L. Rawls

Stellar Astronomer and Data Scientist

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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 **UW Department of Astronomy** Seattle, Washington
LSST Data Management Postdoctoral Research Associate
- Research and development of astronomical methods, algorithms, and software to identify transients with the Large Synoptic Survey Telescope
 - Continuing research in stellar astronomy
- 2010–2016 **NMSU Department of Astronomy** Las Cruces, New Mexico
Research Associate
- Observed and modeled red giants in eclipsing binaries as a gateway to asteroseismology, stellar evolution, and the Milky Way
 - 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

experience

- 2016–Now **Student Advisor** SDSS FAST / New Mexico State University
Primary mentor and scientific resource for a post-baccalaureate astronomer
- 2015–Now **Instructor** Ghost Ranch Education & Retreat Center, Abiquiu, NM
Designing and leading astronomy-themed weekend retreats for all ages
- 2013–Now **Science Writer and Editor** Astrobites Collaboration, astrobites.com
Astrobites blog: daily summaries of recent research papers in astronomy
Spearheaded website redesign and launch (2015), Social Media Czar (2016+)
- 2013 **ComSciCon Graduate** Communicating Science Conference
Implemented novel ways to effectively communicate to scientists and the public
One of 50 attendees selected from >700; piece published at astronomy.com
- 2013 **Astronomy Ambassador** American Astronomical Society & Astronomical Society of the Pacific
Trained in effective techniques to teach scientific concepts to varied audiences

awards

- 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

- 2016–Now **ComSciCon-PNW Organizing Committee Chair** comscicon.org, Seattle, WA
Planning a regional science communication conference for STEM grad students
Chair of organizing committee for two-day event to be held in 2017
- 2016 **General Education Astronomy Source (GEAS) Trainer** astronomy.nmsu.edu/geas, Remote
Helped familiarize educators nationwide with distance learning astronomy labs
- 2015, 2016 **GeekGirlCon Panelist and DIY-Sci-Zone Agent** Seattle, WA
Invited to speak on several science panels and lead hands-on experiments
- 2015 **Software Carpentry Workshop** NMSU, Las Cruces, NM
Lead organizer for a department-wide workshop on scientific computing
Served as a “helper” for instructors and learners during the two-day event
- 2015 **Inclusive Astronomy Conference** Vanderbilt University, Nashville, TN
Worked to break down barriers to access and create a community of inclusivity
- 2015 **AAS Media Intern** American Astronomical Society
Press representative and Astrobites live-blogger for the 225th AAS Meeting
- 2014 **.Astronomy Conference** dotastronomy.com/six, Chicago, IL
Contributor to a participant-driven astronomy-online event and hackathon
- 2014 **Session Chair** NRAO, Socorro, NM
Session 2, The 30th Annual New Mexico Symposium
- 2014 **SciCoder Workshop** NYU, New York City, NY
Gained proficiency with python, git, SQLite, and other computing tools
- 2012–2015 **Executive Council Committee on Science, Technology & Faith** The Episcopal Church
Researched issues such as GMOs to create church policy recommendations
- 2008–Now **Public Outreach** Various locations
Star parties, eclipse viewing events, open houses, school visits, and field trips

publications

Testing the Asteroseismic Scaling Relations for Red Giants with Eclipsing Binaries

Observed by Kepler

P. Gaulme, J. McKeever, J. Jackiewicz, **M. L. Rawls**, E. Corsaro, B. Mosser, J. Southworth, S. Mahadevan, C. Bender, & R. Deshpande

2016, *The Astrophysical Journal*, In Press

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, J. Jackiewicz, J. A. Orosz, E. Corsaro, P. G. Beck, B. Mosser, D. W. Latham, & C. A. Latham
 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**, J. Jackiewicz, B. Mosser, & J. A. Guzik
 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, M. A. P. Torres, C. D. Bailyn, & M. M. Buxton
 2011, *The Astrophysical Journal*, 730, 25

presentations

(t) = talk (p) = poster

- (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, The 19th Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun
 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) Celestial Stories Hidden in Starlight
 2016 February, Sky Bowl of Stars Retreat, Ghost Ranch Conference Center
- (t) Using Eclipsing Binary Star Systems to Measure Starquakes
 2016 January, Portland State University BIO Better Know a Lab Seminar Series
- (t) What Makes Red Giants Tick? Linking Tidal Forces, Activity, & Solar-Like Oscillations via Eclipsing Binaries
 2016 January, 227th American Astronomical Society Meeting, #105.06D
- (t) Testing Asteroseismology with Red Giants in Eclipsing Binaries
 2015 September, University of Washington Astro Lunch
- (t) Pluto's Close Encounter
 2015 June, New Mexico State University Sigma Xi Science Cafe
- (t) The Life Story of Stars
 2015 March, New Mexico State University "Three Minute Thesis" Competition
- (p) The Double Red Giant Binary With Odd Oscillations
 2015 January, 225th American Astronomical Society Meeting, #345.16
 Chambliss Astronomy Achievement Student Award Honorable Mention
- (t) Red Giants, Eclipsing Binaries, and Asteroseismology
 2014 November, The 30th Annual New Mexico Symposium
- (t) A Very Cursory Introduction to Github and Friends
 2014 August, NMSU Astronomy Graduate Student Organization
- (t) A Tale of Two Red Giants: Testing Asteroseismology with KIC 9246715
 2014 April, New Mexico Space Grant Symposium
- (t) Red Giants in Eclipsing Binaries as a Benchmark for Asteroseismology
 2014 April, New Mexico State University "Three Minute Thesis" Competition
- (t) A Tale of Two Red Giants: Testing Asteroseismology with KIC 9246715
 2014 March, NMSU Graduate Research and Arts Symposium

- (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 American Astronomical Society Meeting, #405.04
- (t) Red Giants in Eclipsing Binaries: Two for the price of one
2013 October, NMSU Undergraduate Society of Astronomy Students
- (t) Twitter and You: From Twit to Tweeter
2013 September, NMSU Astronomy Graduate Student Organization
- (t) Red Giants in Eclipsing Binaries: Kepler Light Curves, Radial Velocities, & Asteroseismology
2013 July, Giants of Eclipse, 40302
- (t) Red Giants in Eclipsing Binaries: Modeling of Candidates from Kepler Data
2013 April, New Mexico Space Grant Symposium
- (t) Effective Outreach: Astronomy Ambassadors
2013 January, NMSU Department of Astronomy Pizza Lunch (with Jillian Bornak)
- (p) Red Giants in Eclipsing Binaries: First Look at Kepler Light Curves
2013 January, 221st American Astronomical Society Meeting, #142.16
- (t) Hands-on Astronomy: Classroom Activities
2012 June, NMSU K-12 Teacher Training Workshop
- (p) Light Curve Solutions of Eclipsing Binaries in the Large Magellanic Cloud
2012 January, 219th American Astronomical Society Meeting, #153.41
- (t) My Indian Summer: The IRES Graduate Program in Bangalore, India
2011 September, NMSU Department of Astronomy Pizza Lunch
- (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
2011 June, Indian Institute of Astrophysics Colloquium, Bangalore
- (t) Refined Neutron Star Mass Determinations in Six Eclipsing X-Ray Pulsar Binaries
2010 September, NMSU Department of Astronomy Pizza Lunch
- (t) Refined Neutron Star Mass Determinations in Six Eclipsing X-Ray Pulsar Binaries
2010 April, SDSU Department of Astronomy Colloquium, Master's Thesis Defense
- (p) New Observations and Neutron Star Mass for the X-ray Binary 4U 1538-52
2010 January, 215th American Astronomical Society Meeting
- (p) Refining the Neutron Star Mass Determination in Six Eclipsing X-ray Pulsar Binaries
2009 January, 213th American Astronomical Society Meeting
- (t) Ups And Downs in the Life of a Cataclysmic Variable: The Long-Term Behavior of CM Phe
2008 May, Harvey Mudd College Presentation Days, Senior Thesis Presentation
- (p) Ups And Downs in the Life of a Cataclysmic Variable: The Long-Term Behavior of CM Phe
2008 January, 211th American Astronomical Society Meeting