

MICHAELA BETH ALLEN

CONTACT INFORMATION

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EDUCATION

Texas A&M University-Commerce, Commerce, TX USA

M.S. Physics, August 2021

- Thesis Topic: Pulsating White Dwarfs in the Open Star Cluster M67
- Advisor: Dr. Kurtis Williams

Angelo State University, San Angelo, TX USA

B.S. Physics, *Cum Laude*, May 2019

- Minors: Astronomy, Mathematics
- Honor Societies & Organizations: Sigma Pi Sigma Honor Society, Society of Physics Students, Mathematical Association of America, Young Life

EXPERIENCE

Colby College, Waterville, ME USA

LAB INSTRUCTOR OF PHYSICS & ASTRONOMY **August 2021 to Present**

- PH141 labs cover topics in introductory mechanics such as kinematics, conservation of energy/momentum, simple harmonic motion, etc. PH145 labs cover topics in introductory electricity and magnetism such as Gauss' Law, Faraday's Law, optics, etc.
- AS151 labs cover introductory topics in astronomy such as Kepler's Laws, Doppler shift, Hubble's Law, learning to navigate the night sky, learning to operate telescopes, etc. AS231 labs cover more advanced topics in observational astrophysics such as photometric data collection, reduction, and analysis, as well as how to write a formal report. Both AS courses include afternoon and evening laboratory experiences.

OBSERVATORY DIRECTOR

August 2021 to Present

- In addition to teaching labs, I also reside over the Collins and Young Observatories located on campus. The Young Observatory houses a fully-automated 0.7m CDK PlaneWave telescope, and the Collins Observatory houses a 14-inch Schmidt-Cassegrain telescope. Both are equipped with CCD cameras and photometric filter wheels. The observatory as a whole also has a collection of portable telescopes ranging from Meade LX90s to a Lunt H-Alpha Solar telescope.

Texas A&M University-Commerce, Commerce, TX USA

GRADUATE RESEARCH ASSISTANT

January 2021 to July 2021

- I worked with Dr. Kurtis Williams to study an ensemble of white dwarfs in the open star cluster M67. This included performing time-series aperture photometry and the use of period analysis software.

GRADUATE TEACHING ASSISTANT

August 2019 to December 2020

- I taught undergraduate astronomy labs and was a TA for introductory astronomy lecture courses. The labs were conducted in a hybrid learning environment to include classroom and planetarium (Digistar 5 all-digital projection system) settings. I graded for these labs as well as other undergraduate astronomy courses.

Angelo State University, San Angelo, TX USA

RR LYRAE VARIABLE STAR RESEARCH

January 2018 to May 2019

- I worked with Dr. Kenneth Carrell to determine effects of shock wave phenomena in RR Lyrae variable stars. This included spectroscopic data collection, reduction, and analysis.

PLANETARIUM ASSISTANT / PHYSICS GRADER

August 2017 to May 2019

- I performed management duties during weekly planetarium (Sci-Dome HD projector) performances that included tasks such as greeting patrons, running the cash register, giving constellation tours, and preparing telescopes for patron use.
- I also graded introductory physics labs for several professors.

NASA Goddard Space Flight Center, Greenbelt, MD USA

ASTROPHYSICS INTERN

June 2018 to August 2018

- I worked with Dr. Marc Kuchner and Dr. Sarah Logsdon as a science team member for the citizen science project, Backyard Worlds. I sorted through thousands of objects found in images from NASA's WISE telescope to determine brown dwarf candidates. I also reduced photometric data and performed aperture photometry on some of the highest priority candidates.

OBSERVING
EXPERIENCE

SARA Observatories, Global

- Remote photometric observations of white dwarfs on three 1 meter telescopes located at ORM, Kitt Peak, and CTIO.
- Trained undergraduate students on how to use the telescope located at ORM.

TAMU-C Observatory, Commerce, TX USA

- In-person photometric observations of white dwarfs with the 0.7m CDK PlaneWave telescope.
- Trained an undergraduate student on how to use this telescope.

McDonald Observatory, Fort Davis, TX USA

- In-person spectroscopic observations of RR Lyrae variable stars on the 2.1 m telescope with the high-resolution Sandiford Echelle Spectrograph.
- I was the lead on candidate selection, the creation of observing schedules, and all data reduction and analysis.

Infrared Telescope Facility, Mauna Kea, HI USA

- Remote spectroscopic observations of brown dwarfs with the SpeX instrument.

Various Celestron/Meade/etc. Telescopes, San Angelo, TX USA & Commerce, TX USA

- Served as Planetarium Assistant at ASU where I set up and operated several portable telescopes on a weekly basis for patron use. Inventoried all telescope accessories and organized storage space resulting in 100% accountability.
- Actively participated in local amateur astronomy club. Participated in seasonal star parties where I would assist members in the set up and operation of their telescopes as well as give constellation tours to the public.
- At TAMU-C, I volunteered to assist in extra-credit sessions at the TAMU-C Observatory where I would assist students in the use and operation of portable telescopes and give constellation tours.

SKILLS

Programming Languages & Software

- Very experienced with IRAF/PyRAF for both spectroscopic and photometric data reduction and analysis. All reductions were completed manually with standard IRAF tools and with the help of a few commands from built-in pipelines.
- Very experienced with Python. I have taken undergraduate and graduate computational physics courses. I have also written code for further spectroscopic data analysis (cosmic ray rejection and normalization).
- Very experienced in Mac OS, Linux, and Windows 10 systems.
- Very experienced with TOPCAT, AstroImageJ, and Period04.

Personal & Communication

- I am a very quick learner, and I enjoy a challenge.
- Very organized and detail oriented. I would rather give too much information than not have given enough.
- Very experienced in keeping observing logs and recording all necessary information needed during observing.
- I have a real passion for astronomy outreach. I have been a part of the citizen science project Backyard Worlds since the launch of the project in 2017, and I love getting others involved in all aspects of citizen science.

SELECTED PUBLICATIONS

Allen, Michaela B. 2021, Pulsating White Dwarfs in the Open Star Cluster M67, Texas A&M University-Commerce, ProQuest Dissertations Publishing, 28646263.

Meisner, Aaron M., Schneider, Adam C., Burgasser, Adam J., **et al.** 2021, New Candidate Extreme T Subdwarfs from the Backyard Worlds: Planet 9 Citizen Science Project, *The Astrophysical Journal*, Volume 915, Issue 2, id.120, doi:/ 10.3847/1538-4357/ac013c.

Meisner, Aaron M., Faherty, Jacqueline K., Kirkpatrick, J. Davy, **et al.** 2020, Spitzer Follow-up of Extremely Cold Brown Dwarfs Discovered by the Backyard Worlds: Planet 9 Citizen Science Project, *The Astrophysical Journal*, Volume 899, Issue 2, id.123, doi:10.3847/1538-4357/aba633.

Debes, J. H., Thévenot, M., Kuchner, M. J., **et al.** 2019, A 3 Gyr White Dwarf with Warm Dust Discovered via the Backyard Worlds: Planet 9 Citizen Science Project, *The Astrophysical Journal*, 872, L25, doi:/10.3847/2041-8213/ab0426.