Sarah Parker

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Summary of Qualifications

Master of Science in Physics with a decade of experience in scientific public outreach in both astronomy and quantum physics as well as research experience in extragalactic astronomy.

Education

Physics, Master of Science — Degree Awarded: May 2020
University of Missouri — Columbia, Missouri

Physics, Bachelor of Science — Degree Awarded: May 2018
University of Wisconsin-Stevens Point (UWSP) — Stevens Point, Wisconsin
Minor: Mathematics

Professional Experience

Adjunct Instructor of Astronomy, University of Wisconsin–Whitewater
August 2025- Present

- Delivers engaging lectures, guided math sessions, and laboratory sessions to undergraduate students in Astronomy 112.
- Provides one-on-one office hours for students to provide academic support and mentorship.
- Organize and update all course materials including homework, guided work sessions, warm-up quizzes, labs, and exams.

Quantum Outreach Program Manager, University of Wisconsin–Madison
October 2023-Present

- Develops and runs quantum education and workforce development programs funded under NSF Quantum Leap Challenge Institute HQAN.
- Develops and distributes kits for K-12 classrooms, which are based on quantum physics principles, across U.S. states and territories through QuanTime. In 2024, 900 kits were distributed.
- Organizes and facilitates TeachQuantum, a professional development program for high school teachers at rural schools where they experience quantum experiments and develop curriculum for their classrooms.

Planetarium Educator, Horwitz-DeRemer Planetarium
January 2021-Present

- Communicates knowledge of astronomy in a fun and engaging manner to groups of students from the Waukesha School District as well as the general public.

- Develops and scripts specialty planetarium shows in Digistar 6 on various topics from the history of astronomy to the science behind seasons.
- Writes and receives grants for updating the planetarium, installing interactive exhibits, purchasing shows that align with Next Generation Science Standards, and developing public outreach efforts.
- Developed, in conjunction with the team, a bilingual public outreach program titled “the Sun and Su Familia” which has expanded the reach of the planetarium to the Spanish-speaking community of Waukesha and improved the science literacy of all students in both English and Spanish.

Theater Presenter and Developer, Adler Planetarium
January 2022-January 2023

- Coded and developed appealing visuals with the newest James Webb Space Telescope images, dynamic seasonal scenes, and unique perspectives of astronomical events for the dome using Digistar 6.
- Presented current astronomical topics and news, stargazing techniques, and the facts, history, and mythology of astronomical objects to the hundreds of planetarium visitors daily.

Astronomy Research Experience

Postbaccalaureate Research, Advisor: Dr. Melinda Soares-Furtado, University of Wisconsin–Madison

- Symmetry and Periodicity of Dipper Stars in the Orion Nebula Cluster (ONC), *September 2025-Present*
    - Creating a catalog of Dipper Stars in the ONC using James Webb Space Telescope Data. Using Python to analyze data and determine the periodicity and symmetry of the variability of brightness for a class of young stellar objects called dipper stars.

Graduate Research, Advisor: Dr. Yicheng Guo, University of Missouri

- Cataloging Galaxies in the Deepest Regions of Hubble Observation, *August 2018-May 2020*
    - Analyzed data from Hubble eXtreme Deep Field (HXDF) image using Python coding, ds9, and SExtractor to create a catalog of all of the galaxies in the image along with their various parameters.

Undergraduate Research, UW-Stevens Point

- Morphology of Lenticular Galaxies in Isolated vs. Group Environments, Advisor: Dr. Adriana Durbala, *September 2017-May 2018*
    - Used BUlge Disk Decomposition Analysis (BUDDA) Fortran code to study how the bulges, disks, and bars of lenticular galaxies vary in nature versus nurture scenarios.

- Solar Eclipse Research on Bailey's Beads, Advisor: Prof. Arthur Stevenson, *August 2017*
    - Gathered video and images through multiple telescopes of the Bailey's Beads phenomenon during the 2017 Total Solar Eclipse in Eastern Wyoming.
    - Results of this trip were chronicled here: Stevenson, A.T. and Wernicke, L.J., 2019. In The Shadow of the Moon: Planning an Eclipse Expedition. Astronomical Society of the Pacific.
- Morphology of Elliptical Galaxies in Isolated vs. Group Environments, Advisor: Dr. Adriana Durbala, *January 2016-May 2017*
    - Used BUlge Disk Decomposition Analysis (BUDDA) Fortran code to study how the bulges of elliptical galaxies vary in isolated versus group environments.

Research Experience for Undergraduates, Advisor: Dr. Peter Brown, Texas A&M

- Researching Light Curves of Type Ia Supernovae, *May-August 2017*
    - Used Python to create a template light curve of Type Ia Supernovae (SNe Ia) in the optical and ultraviolet wavelengths to gain insight into the validity of our use of SNe Ia as standard candles.

Observing Experience

Kitt Peak National Observatory
April 2016, October 2016, and October 2017
Operated the 0.8 m WIYN telescope.

McDonald Observatory
July 2017
Operated the 0.8 m and 0.9 m telescopes.

ALFALFA Workshop and Observing at Green Bank Observatory
June 2016
Attended an intensive workshop about radio observing and extragalactic astronomy. Observed with the 40 ft Tatel telescope.

Awards

UWSP Department of Physics & Astronomy Monica E. Bainter Scholarship, *May 2017*

Wisconsin Space Grant Consortium (WSGC) Undergraduate Research Fellowship, *March 2016, March 2017*

Wisconsin Space Grant Consortium (WSGC) Undergraduate Scholarship, *March 2016, March 2017*

UWSP Department of Physics & Astronomy First-Year Scholarship, *September 2014*

Publications

Onubi, P.O., Sani, I.A., Idogbe, E.A., Njoku-Achu, N.O., Sunday, C.N., Okany, C.F., Okere, A.R., Nnaji, J.C., **Parker, S.**, Gozman, K. and McCulloch, A., 2022, October. An Exposition on Globular Clusters: Theory and Observation. In Astronomical Society of the Pacific Conference Series (Vol. 533, p. 70).

Presentations

"Space Telescopes: Then and Now" NASA Subject Matter Expert Presentation
November 2021
Hour-long public presentation sponsored by NASA on the history of telescopes, with a particular focus on space telescopes, leading up to the launch of the James Webb Space Telescope

"Sizes of Galaxies" University of Missouri Astrophysics/Relativity Seminar
April 2019
Hour-long departmental presentation on the currently accepted methods of measuring galaxy sizes and how it was incorporated into the cataloging of the Hubble eXtreme Deep Field.

"Researching Light Curves of Type Ia Supernovae: Texas A&M REU 2017" University of Wisconsin-Stevens Point Department of Physics and Astronomy Colloquium
October 2017
30 minute departmental presentation on the methods and outcomes of the REU project at Texas A&M.

Posters

"Lenticular Galaxies in Different Environments – Isolated versus Group Environment"
Poster presentation, Undergraduate Research Symposium, UW-Stevens Point, *May 2018*

"Elliptical Galaxies in Different Environments – Isolated versus Group Environment"
Poster presentation, Wisconsin Space Grant Consortium Conference, *August 2017*

"Comparison of Light Curves for Type Ia Supernovae in the Optical and Ultraviolet"
Poster presentation, Texas A&M REU Symposium, *August 2017*

"Elliptical Galaxies in Different Environments – Isolated versus Group Environment"
Poster presentation, Undergraduate Research Symposium, UW-Stevens Point, *May 2017*

"To Infinity and Back: Construction and Flight of an Experimental High Altitude Rocket"
Poster presentation, Undergraduate Research Symposium, UW-Stevens Point, *May 2017*

Grants

Wisconsin Space Grant Consortium (WSGC) Special Initiatives Program
December 2021
Assisted with grant writing and preparation for the purchase of the planetarium show "Supervolcanoes," which aligns with the Next Generation Science Standards, for the Horwitz-DeRemer Planetarium.

Packers Foundation Education Grant
November 2021
Assisted with grant writing and preparation for the purchase of bilingual planetarium shows for the Horwitz-DeRemer Planetarium.

Waukesha Education Foundation Grant, Gravity Maze Interactive Floor Displays
June 2021
Assisted with grant writing and preparation for an interactive gravity maze floor display at the Horwitz-DeRemer Planetarium.

Teaching and Tutoring

Teaching Assistant, University of Missouri,
January 2020-May 2020

- Planned and taught hybrid labs for algebra-based electrodynamics students.
- Advised students for 100-level astronomy during their moon phases project.
- Graded students' homework, labs, and exams.
- Communicated difficult concepts in a fun and effective way.

Astronomy Tutor, UWSP Tutoring-Learning Center,
October, 2015-May 2017

- Helped students improve study skills and test taking strategies.
- Had a thorough knowledge of Astronomy 100 course content.
- Developed activities and worked with the course instructor to promote learning.

Volunteering

Volunteer, Yerkes Observatory
March 2023-Present
Present about various topics, such as Messier objects, nebulae, and galaxies in a portable planetarium.

Demonstrate and explain a gravity well to guests using fabric and spheres of various sizes and weights. Topics explained include waves, interferometry, gravitational waves, LIGO, and gravitational lensing.

Volunteer, Geneva Lake Astrophysics and STEAM
June 2021-Present
Remotely operate the 20” telescope at Stone Edge Observatory as part of a project to advise Nigerian students in their research on globular clusters.
Make 3D models in Blender for various uses, including accessibility, and print prototypes.
Assist in astronomy outreach events for school groups, scout groups, and the general public. This includes operating telescopes for public observation and explaining various demonstrations about the Solar System, galaxies, and telescopes.
Build and work with sensors to measure light pollution. Developed a system to effectively calibrate and test sensors.

Astronomy Public Outreach Assistant, University of Missouri
September 2018-August 2020
Guided guests through the observatory while providing intriguing and relevant information while operating a 0.4m telescope without guiding technology.

Physics and Astronomy Graduate Student Association (PAGSA) Social Events Coordinator, University of Missouri
January 2019-December 2019
Organized and planned events for PAGSA, while keeping track of expenditures.

Society of Physics Students (SPS) President, University of Wisconsin-Stevens Point
September 2017-May 2018
Organized public outreach and club activities, led club meetings, and communicated scholarship opportunities to SPS members.

Star Party Host, Texas A&M University
May-August 2017
Operated various Meade telescopes and provided relevant information on the objects viewed through the telescope.

Society of Physics Students Treasurer, University of Wisconsin-Stevens Point
January 2015-May 2017
Managed club funds and helped with organizing public outreach and club activities.

Team Lead, WSGC Collegiate Rocket Launch, University of Wisconsin-Stevens Point
October 2016-May 2017
Founded University of Wisconsin-Stevens Point's first Collegiate Rocket Team.
Designed and fabricated a high-powered rocket from scratch which generates energy during flight and used Python to predict altitude and power output.
Programmed Arduino Uno units to record in-flight data.
Managed and delegated responsibilities to the team, wrote reports, and gave presentations.

Planetarium Lecturer, Allen F. Blocher Planetarium, UWSP
January 2015-May 2018
Provided educational shows to school groups, clubs, and the general public. Operated multiple slide projectors, star ball, control panel, and computer running a Spitzer system.

Telescope Operator, Arthur J. Pejsa Observatory, UWSP
January 2015-May 2018
Operated a 0.4 meter Meade computer-controlled telescope. Managed large groups of people and provided relevant information on objects viewed through the telescope.

Technical Skills

- Experience using Linux, Mac, and Windows operating systems.
- Experience with astronomical software such as IRAF, ds9, TOPCAT, SExtractor, and Fortran (BUDDA) code.
- Experience coding in Python and SQL.
- Familiarity with Mathematica and programming Arduinos.