

EDUCATION

Arizona State University

8/22-TBD

PhD in Astrophysics

Advisor: Sara Walker, NSF Fellow

University of Wisconsin-Madison

9/18-5/22

Bachelor of Science in Physics and Mathematics

GPA of 3.837/4.0.

RESEARCH EXPERIENCE

Undergraduate Researcher

1/20-9/22

UW-Madison Observational Cosmology Lab: NASA's EXCLAIM Mission

Modeling the optical system of NASA's EXperiment for Cryogenic Large-Aperture Intensity Mapping (EXCLAIM), a balloon-borne microwave telescope. Installed Computer Simulation Technology, CST, on UW-Madison's Center for High Throughput Computing, which is now used by multiple campus researchers. Performing electromagnetic simulations and diffractive analysis using CST and the python package Poppy. Earned 3rd author, out of 45, on an optical design paper.

Undergraduate Researcher

3/19-8/22

UW-Madison Observational Cosmology Lab: Tianlai Pathfinder Array

Simulated Tianlai single dishes to test the impact of mechanical components on the beam pattern. Created assays of the interferometer's data classifying radio frequency interference and other systematics. Leading the Tianlai Periodicity Search (TPS): a novel untargeted search for astronomical radio sources with periods ranging from minutes to hours. TPS will use more than 200 days of data taken on the North celestial pole, and is the first experiment of its kind.

Summer Intern

5/19-8/19

Arecibo Observatory: Single-Pulse Analysis of Millisecond Pulsars

Observed the millisecond pulsars J1022+1001 and J1713+0747 with the late 305 meter telescope in Arecibo, Puerto Rico. Developed and performed statistical single pulse analyses of the pulsars to study their stability. This work was presented at the American Astronomical Society conference in January of 2020 and two papers are in preparation.

Undergraduate Researcher

9/18-5/19

UW-Madison Baum Lab, Origin of Life Project

Ran experiments that mimic the chemistry of early Earth to replicate the origin of life. Imaged chemical growths using a Scanning Electron Microscope (SEM). Created MATLAB population simulations to model our data.

ACADEMIC AWARDS AND SCHOLARSHIPS

NSF Graduate Research Fellowship (2022, \$138,000): Recognizes and supports outstanding graduate students in STEM disciplines.

Goldwater Scholarship (2021, \$7,500): One of 409 selected nationally based on scientific, mathematic, and engineering achievement.

Astronaut Scholarship (2021, \$15,000): One of 60 scholars selected nationally, primarily on the basis of graduate-level research achievement.

Wisconsin Space Grant Consortium Research Grant (2021, \$4,000): Awards research support to create and implement a research study of the student's design.

Hilldale Undergraduate/Faculty Research Fellowship (2021, \$3,000): Research Fellowship to support undergraduate research done in collaboration with UW-Madison faculty.

Hagengruber Scholarship (2021, \$2,000) Awarded to an undergraduate Wisconsin resident that shows exceptional promise for a future in physics.

Wisconsin Space Grant Consortium Scholarship (2021, \$2,000): Awarded to outstanding undergraduate students who are pursuing space-related studies.

Liebenberg Family Research Award (2020, \$3,000): Awarded annually based on merit to a junior majoring in Physics.

Henry and Eleanor Firminhac Physics Award (2019, \$2,000): Awarded for quality of physics course work and financial need.

Kemper K. Knapp Scholarship (2018): Awarded to incoming freshman based on academic merit.

Arnold P. Stamm Scholarship (2018): Awarded to top students of graduating class.

Manawa Lodge Scholarship (2018): Awarded based on academic merit.

PUBLICATIONS

“Experiment for Cryogenic Large-Aperture Intensity Mapping: Instrument design”, JATIS, Switzer, E., et al. 2021

“The Tianlai Dish Pathfinder Array: design, operation and performance of a prototype transit radio interferometer”, MNRAS, Wu, F., et al. 2021, arXiv:2011.05946

“Modeling the Optical System of NASA’s EXCLAIM Mission”, Proceedings of the Wisconsin Space Conference, Siebert, G., et al. 2022

“Optical design of the EXperiment for Cryogenic Large-Aperture Intensity Mapping (EXCLAIM)”, SPIE Conference Proceeding, Essinger-Hileman, T., Oxholm, T., Siebert, G., et al. 2020, arXiv:2012.10481

“Overview and status of EXCLAIM, the experiment for cryogenic large-aperture intensity mapping”, SPIE Conference Proceeding, Cataldo, G., et al. 2020, arxiv:2101.11734

“Single-pulse properties of three millisecond pulsars”, (submitted to MNRAS), Pal-liyaguru N., et al.

PRESENTATIONS

“The Tianlai Array, a radio cosmology experiment”, invited talk, 2022, Madison Astronomical Society

“Constraining the Expansion of the Universe by Mapping Neutral Hydrogen”, talk, 2021, Astronaut Scholar Technical Conference

“Modeling the Optical System of NASA’s EXCLAIM Mission”, talk, 2021, Wisconsin Space Conference

“Tianlai Periodicity Search”, talk, 2021, UW-Madison Physics Department Board of Visitors

“Multifrequency Single-Pulse Study of Millisecond Pulsars”, poster, Siebert, G. L., Palliyaguru, N. T., & Perera, B. B. 2020, American Astronomical Society Meeting Abstracts #235

“Multifrequency Single-Pulse Analysis of Millisecond Pulsars”, talk, 2019, Arecibo Observatory

SOFTWARE SKILLS

MATLAB, Python, CST, POPPY, Latex, Mathematica, Linux/Unix, HTCondor, PRESTO, DSPSR, PSRCHIVE, PSRSALSA, HTML