Mackenzie Ticoras

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Education

Michigan State University (MSU)   **East Lansing, Michigan**
Doctor of Philosophy in Astrophysics   *July 2023 – present*
and Computational Math, Science and Engineering (*dual PhD*)   GPA: 4.0/4.0
Advisor: Brian O'Shea

The Ohio State University (OSU)   **Columbus, Ohio**
Bachelor of Science in Physics and Astronomy (*double major*)   *August 2019 – May 2023*
Honors Research Distinction and Honors in the College of Arts and Sciences   GPA: 3.95/4.0
Undergraduate Thesis: "Refinement of Stellar Intensity Interferometry at VERITAS"
Advisor: Michael Lisa

Research Experience

FOGGIE CGM Simulations   **MSU**
Graduate Researcher   *July 2023 – present*
Investigate the circumgalactic medium using FOGGIE simulations

* Software development for processing FOGGIE CGM simulations
* Investigating spatial and kinematic distribution of ions in the Circumgalactic Medium (CGM) of Milky Way-like galaxy simulations.

VERITAS Stellar Intensity Interferometry   **OSU**
Undergraduate Researcher   *October 2020 – July 2023*
Stellar measurements with digitized intensity interferometry (SII)

* Software development for VERITAS-SII data processing
* Characterization of extraneous noise source apparent in the data
* Study of pulse shapes output by photo-multiplier tubes from the VERITAS telescopes
* Perform angular diameter measurements of approximately spherical stars

Teaching Experience

Certification in College Teaching (In Progress)   **MSU**
Student   *January 2025- Present*
The goal of this program is to help graduate students and postdocs develop their teaching skills specifically with undergraduates in mind.

Math and Statistics Learning Center   **OSU**
Student Tutor; Senior Student Tutor   *January 2021 – August 2021; August 2021-May 2023*
Tutor college-level math classes including college algebra, all levels of calculus, and linear algebra

Presentations

Resolving The CGM and its Impact on Galaxy Evolution   **Santa Cruz, Chile**
Investigating kinematics and spatial distribution of multiphase gas in the CGM   *November 2024*

Ohio State Stellar Intensity Interferometry Conference 2023   **Columbus, Ohio**
Measurement of Merak with VERITAS SII   *May 2023*

VERITAS Collaboration Meeting Winter 2023   **Tuscon, Arizona**
An Angular Diameter Measurement of β UMa   *January 2023*

OSU Astronomy Department Undergraduate Summer Symposium   **Columbus, Ohio**
A Uniform Disk Visibility Curve for bet UMa   *July 2022*

240th Meeting of the American Astronomical Society   **Pasadena, California**
An intensity interferometry measurement of gamma Orionis   *June 2022*
(Bellatrix) with the VERITAS telescope array

Eastern Great Lakes Section of the American Physical Society   **Youngstown, Ohio**
An intensity interferometry measurement of gamma Orionis   *April 2022*
(Bellatrix) with the VERITAS telescope array

Publications

"An Angular Diameter Measurement of Merak via Stellar Intensity Interferometry with the VERITAS Array" **Corresponding Author: Mackenzie Ticoras**   *May 2024*

Technical Skills

Observation experience: 9 nights of intensity interferometry observations at the VERITAS telescopes

Computational experience: Skills include data analysis, parallel processing and Root @ Cern Library, yt and many other Python packges

Instrumentation experience: Work with photo-multiplier tubes, high voltage supplies, electronic amplifiers, and oscilloscopes

Awards and Honors

National Science Foundation Graduate Research Fellowship	*March 2023*
University Distinguished Fellowship	*March 2023*
Physics Senior Award at OSU	*March 2023*
College of Natural Sciences Recruiting Fellowship, Declined	*February 2023*
Undergraduate Research Scholarship at OSU	*April 2022*
Best Undergraduate Oral Presentation at EGLS APS	*April 2022*
Smith Junior Award at OSU	*April 2022*
Goldwater Scholarship	*March 2022*
Physics Summer Research Scholarship at OSU	*Summer 2021*
Provost Merit Scholarship (Awarded Semesterly)	*Autumn 2019 -2021*
The Ohio State University Dean's List (Awarded 8 Semesters)	*Autumn 2019 - Spring 2023*

Undergraduate Honors Program member at OSU   *Autumn 2019 – Spring 2023*

Computation and Computer Skills

Advanced: C++, Python, and Parallel Processing

Intermediate: Github, Shell Scripts and Root @ Cern library

Basic: Mathematica, HTML, JavaScript, Machine Learning, and MatLab

Outreach and Leadership Experience

Michigan State Observatory Outreach   **MSU**
Outreach Assistant   *November 2024 – Present*
Helped facilitate outreach events and public nights at the MSU observatory

Stellar Mentorship Program   **MSU**
Stellar Mentor   *September 2023 – Present*
Program Leader   *August 2024 – Present*
Mentorship program for all career levels

Code 4 Community   **OSU**
Member   *August 2020 – May 2023*
President   *May 2022 – May 2023*
Project Lead   *May 2021 – May 2023*
Treasurer   *May 2021 – May 2022*
Computer science outreach organization

Other Service

Prospective Student Visit   **MSU**
Organizer   *Spring 2024 and 2025*
For two years, I helped plan the prospective student visits at MSU

Graduate Student Curriculum Committee   **MSU**
Committee Member   *December 2024- Present*
Plan a new curriculum for future graduate students at MSU