

Mackenzie Ticoras

✉ scott59@msu.edu • in mackenzie-scott-121697242
🆔 0009-0004-7242-0204 • 🌐 kenzerkay

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
* Study ion distributions with respect to spacial location in the CGM and also covariance with one another

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

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*

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| VERITAS COLLABORATION MEETING WINTER 2023 <i>An Angular Diameter Measurement of β UMa</i> | Tuscon, Arizona <i>January 2023</i> |
| OSU ASTRONOMY DEPARTMENT UNDERGRADUATE SUMMER SYMPOSIUM <i>A Uniform Disk Visibility Curve for β UMa</i> | Columbus, Ohio <i>July 2022</i> |
| 240TH MEETING OF THE AMERICAN ASTRONOMICAL SOCIETY <i>An intensity interferometry measurement of gamma Orionis (Bellatrix) with the VERITAS telescope array</i> | Pasadena, California <i>June 2022</i> |
| EASTERN GREAT LAKES SECTION OF THE AMERICAN PHYSICAL SOCIETY <i>An intensity interferometry measurement of gamma Orionis (Bellatrix) with the VERITAS telescope array</i> | Youngstown, Ohio <i>April 2022</i> |

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 packages

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

Awards and Honors

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

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 *Spring 2025*
Plan a new curriculum for future graduate students at MSU