

# Mackenzie Ticoras

✉ scott59@msu.edu • in mackenzie-scott-121697242  
id 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

## Presentations

- "Measurement of Merak with VERITAS SII" by Mackenzie Scott *May 2023*
- \* Ohio State Stellar Intensity Interferometry Conference 2023
- "An Angular Diameter Measurement of  $\beta$  UMa" by Mackenzie Scott *January 2023*
- \* VERITAS Collaboration Meeting Winter 2023
- "A Uniform Disk Visibility Curve for  $\beta$  UMa" by Mackenzie Scott *July 2022*
- \* OSU Astronomy Department Undergraduate Summer Symposium
- "An intensity interferometry measurement of gamma Orionis (Bellatrix) with the VERITAS telescope array" by Mackenzie Scott *April 2022*
- \* Eastern Great Lakes Section of the American Physical Society
  - \* 240th Meeting of the American Astronomical Society *June 2022*

## 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

**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*

\* An NSF Fellowship that provides 3 years of funding during a graduate program.

University Distinguished Fellowship *March 2023*

\* MSU Fellowship offered to top graduate students (approx. 20) by MSU Graduate School providing two years of financial support

Physics Senior Award *March 2023*

\* OSU Physics Department award for outstanding 4th-year students

College of Natural Sciences Recruiting Fellowship, Declined *February 2023*

\* Financial package offered to top-tier prospective CNS graduate students at MSU

Undergraduate Research Scholarship at OSU *April 2022*

\* OSU College of Arts and Science funding for undergraduate research

Best Undergraduate Oral Presentation *April 2022*

\* Best undergraduate presentation at the Eastern Great Lakes Meeting of the American Physical Society

Smith Junior Award *April 2022*

\* OSU Physics Department award for outstanding 3rd-year students

Goldwater Scholarship *March 2022*

\* National scholarship recognizing high academic and research achievement of undergraduate STEM majors

Physics Summer Research Scholarship at OSU *Summer 2021*

\* OSU physics department funding for summer research with a professor in the department

Provost Merit Scholarship (Awarded Semesterly) *Autumn 2019 -2021*

\* OSU merit scholarship based on high school academics

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 Root @ Cern library

**Intermediate:** Github, Mathematica, and Parallel Processing

**Basic:** HTML, JavaScript, Machine Learning, Shell Scripts and MatLab

## Academic, Outreach, and Leadership Experience

---

### STELLAR MENTORSHIP PROGRAM

**MSU**

*Stellar Mentor*

*Septemeber 2023 – Present*

Mentorship program for all career levels

○ Positions held:

- Stellar Mentor

*September 2023 -Present*

### MATH AND STATISTICS LEARNING CENTER

**OSU**

*Senior Student Tutor*

*January 2021 – May 2023*

Tutor position for college-level OSU math classes

○ Classes tutored:

- Calculus 2: Integration Techniques, Sequences, and Series
- Calculus 3: Multi-Variable Calculus
- Linear Algebra

○ Positions held:

- Student Tutor
- Senior Student Tutor

*Spring 2021*

*Autumn 2021-May 2023*

### CODE 4 COMMUNITY

**OSU**

*Member*

*August 2020 – May 2023*

Computer science outreach organization

○ Goal: To create interactive games and modules that teach kids about computer science fundamentals and then present these learning tools at local grade schools.

○ Positions held:

- President – manage club administration and workflow
- Project Lead – lead a group in creating a new learning module
- Treasurer – manage club finances

*May 2022 – May 2023*

*May 2021 – May 2023*

*May 2021 – May 2022*