Ethan Todd

Ann Arbor, MI
✉ *ewtodd@umich.edu*

Education

2023 – Present Fall	**Pre-candidate, Ph.D. Physics**, University of Michigan, Ann Arbor, MI
2020 – 2023 Fall · Spring	**B.S. Physics**, *Summa Cum Laude*, Florida State University, Tallahassee, FL Honors Thesis: Study of Displaced Vertex Tagging with the CMS Experiment Advisor: Prof. Ted Kolberg
2018 – 2020 Fall · Spring	**Foundational Coursework**, Emory University, Atlanta, GA

Publications

1. Yocum, K., Smith, H., **Todd, E.**, Mora, L., Gerakines, P., Milam, S., Widicus Weaver, S., "Millimeter/Submillimeter Spectroscopic Detection of Desorbed Ices: A New Technique in Laboratory Astrochemistry". In: *The Journal of Physical Chemistry A* 123.40 (2019), pp. 8702–8708

Experience

Research

2024 – Present Summer	**Graduate Research Assistant**, University of Michigan, Ann Arbor, MI Advisor: Prof. Igor Jovanovic ○ Gamma ray and neutron detection using scintillation detectors, including energy measurement and pulse shape discrimination ○ Simulations of energy detection efficiency in various semiconductor detectors for gamma rays produced in thermal neutron capture reactions in Ge
2022 – 2023 Summer · Summer	**Laboratory Assistant**, Florida State University, Tallahassee, FL Advisor: Prof. Rachel Yohay ○ Process quality control (PQC) for the CMS High Granularity Calorimeter (HGCAL) ○ Analyzed and presented PQC results; assisted in improving testing procedure at FSU
2021 – 2023 Fall · Spring	**Undergraduate Research Assistant**, Florida State University, Tallahassee, FL Advisor: Prof. Ted Kolberg ○ Aided in machine-learning (ML) based search for long-lived particles using the CMS Experiment ○ Trained ML models on Monte Carlo data with varying signal (mass, lifetime) and background (t, b physics) to verify their ability to identify displaced vertices regardless of the exact physics ○ Investigated most effective parameters of ML models and verified physics-based expectations
2020 – 2020 Summer · Fall	**Undergraduate Research Assistant**, University of Wisconsin-Madison, Remote Advisor: Prof. Susanna Widicus Weaver ○ Analysis of broadband molecular line surveys using the GOBASIC software package ○ Implementation of basic spectral line fitting in Python to accommodate blended spectral peaks

2019 – 2019 Summer Fall	**Summer Undergraduate Research Experience Fellow**, Emory University, Atlanta, GA
	Advisor: Prof. Susanna Widicus Weaver/Dr. Katarina Yocum
	○ Proof-of-concept millimeter/submillimeter spectroscopic measurements of H_2O and D_2O binding energy, sublimation enthalpy, and sublimation entropy
	○ Assisted in data collection, analysis, and literature review
2018 – 2020 Fall Spring	**Undergraduate Research Assistant**, Emory University, Atlanta, GA
	Advisor: Prof. Susanna Widicus Weaver
	○ Millimeter/submillimeter spectroscopy of desorbed astrophysical ice analogs

Teaching

2024 Fall	**Graduate Student Instructor**, University of Michigan, Ann Arbor, MI Course: Physics 121 Physics for Architects Lab
2023 – 2024 Fall Spring	**Graduate Student Instructor**, University of Michigan, Ann Arbor, MI Course: Physics 241 General Physics II Lab
2022 Spring	**Physics Learning Assistant**, Florida State University, Tallahassee, FL Course: PHY 2049C General Physics B
2019 Fall	**Laboratory Teaching Assistant**, Emory University, Atlanta, GA Course: CHEM 150L Structure and Properties Lab

Honors and Awards

2023 Spring	Phi Beta Kappa Society	
2023 Spring	Joseph Lanutti Undergraduate Research Award	*Awarded for third place in the FSU physics departmental poster presentation contest.*
2022 Fall	Evelyn and John Baugh Research Presentation Scholarship	*Awarded to travel and present research at SESAPS.*
2022 Spring	Anna Runyan Undergraduate Endowment	*Awarded for outstanding academic success in physics.*

Computing

Languages	Python (NumPy, SciPy, PyROOT), C++ (ROOT, Geant4), Nix, LaTeX
Operating Systems	Linux, MacOS

Presentations

2. **Todd, E.**, Al Kadhim, A., Bower, N., Goff, R., Laughlin, R., Peñaló, K., Prosper, H., Wade, A., Wulansatiti, M., Yohay, R., "Process Quality Control for HGCAL at Florida State University (poster)". In: *89th Annual Meeting of the Southeastern Section of the American Physical Society, Oxford, MS* (2022)

1. **Todd, E.**, Yocum, K., Gerakines, P., Milam, S., Widicus Weaver, S., "A Novel Use of Rotational Spectroscopy for Studying Characteristics of Desorbed Interstellar Ice Analogs (poster)". In: *Emory SURE 2019 Symposium, Atlanta, GA* (2019)