# Melanie Angela Zaidel

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# **OBJECTIVE**

Seeking to be a Faculty member at a smaller college/university, specializing in Astroparticle Physics Theory or Phenomenology and Multi-messenger Astronomy, with priorities in teaching/mentoring. While I love studying the universe, my biggest motivator is working and connecting with people, especially students whom I can help grow.

## **EDUCATION**

 Ph.D. in Physics August 2022 - 2028

Ohio State University

Columbus, OH

- University Fellow, Patrick S. Osmer Fellow
- National Science Foundation Graduate Research Fellow
- Advisor: John Beacom

• M.S. in Physics August 2022 - July 2024 Ohio State University Columbus, OH

• Candidacy Topic: How do Stars Shine? (According to Physicists.)

· B.S. in Physics, Astronomy & Astrophysics

June 2018 - May 2022 State College, PA

Pennsylvania State University

- o Ronald E. McNair Scholar, Penn State Millennium Scholar
- Advisor: Kohta Murase
- Thesis: Constraining Metastable Very Heavy Dark Matter using the Extragalactic Gamma-Ray Background

## **PROJECTS**

 How do Stars Shine (According to Physicists.) Solar Physics

June 2024 - July 2024

• A  $\nu$  look at the Sun: Probing the conditions of the solar core using  ${}^8{\rm B}$  neutrinos Solar Neutrino Astrophysics

September 2023 - April 2025

• Constraining Metastable Very Heavy Dark Matter using the Extragalactic  $\gamma$ -Ray Background June 2021 - July 2022 Dark Matter Astrophysics

#### **PUBLICATIONS**

C=CONFERENCE, J=JOURNAL, S=IN SUBMISSION, T=THESIS

Zaidel, M. A. and Beacom, J. F. (2025). A  $\nu$  look at the Sun: Probing the conditions of the solar core using  $^8$ B neutrinos. Manuscript submitted for publication in Physical Review C. Preprint on arXiv 2504.10583.

# LEADERSHIP AND SERVICE

#### Upward Bound Speaker and Volunteer

*June* 2025

OSU Department of Astronomy

- Volunteered for OSU Department of Astronomy's Upward Bound Astrophysics Institute for Columbus inner-city high-school students
- · Assisted in designing program activities, presentations, and audience participation
- Presented an accessible and engaging 15-minute talk about the Sun's energy source and how it relates to the solar neutrino problem

#### ASPIRE Speaker and Volunteer

June 2025

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OSU CCAPP ASPIRE

- Volunteered for OSU CCAPP's Achieving in Science through Physics Instrumentation Research and Exploration (ASPIRE) program for high-school students
- · Provided logistical support for program events including inviting speakers, sharing instructional material, and advising on curriculum development
- Presented an accessible and engaging 15-minute talk about the Sun's energy source and how it relates to the solar neutrino problem

# • Undergraduate Residential Summer Access (URSA) Program Liaison

December 2024 - Present

OSU Polaris

· Lead recruiting, interviewing, and onboarding of URSA graduate student Facilitators

 Collects and documents institutional knowledge, procedures, and best practices regarding the URSA program at-large

- Supports Facilitators in teaching, inter-team communication, conflict resolution, and navigation of OSU organizational structure
- Serves as a point-of-contact between URSA Facilitators and Polaris Leadership
- Collects participant feedback on URSA program activities

#### Leadership Member

February 2024 - Present

OSU Polaris

- Designs and maintains the Polaris website
- Assists in curriculum development and facilitation of the Polaris Mentorship Course
- Communicates with Physics and Astronomy Departments and College of Arts and Sciences' organizational structures
- Assists in recruiting student participants for Polaris initiatives
- Mentors undergraduates and junior graduate students in leadership within Polaris
- Meets with Department and College administration to secure funding and organizational support for Polaris
- Assists in managing the OSU Polaris GitHub organization and managing public repositories

#### TEACHING AND MENTORING

• Director Summer 2024, 2025

Mentoring for Undergraduate Researchers in Summer

- · Led a self-designed mini-workshop series for several summer undergraduate research students
- Designed weekly one-hour activities including science communication, keeping a research notebook, forming effective professional relationships with faculty, and Python programming
- $\circ$  Met with students individually to advise them on research tasks, presentations, and career development

Workshop Presenter

OSU Summer Undergraduate Research Program in Astrophysics (SURP)

*Summer* 2024

 Designed and presented four one-hour talks to SURP students about the process and experience of applying to graduate school in Physics and Astronomy

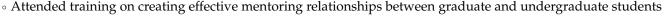
- Answered student questions regarding graduate school applications, fellowships, and timelines
- Served on a question-and-answer panel with fellow graduate students regarding my path in academia

#### • Graduate Student Mentor

August 2023 - Present

OSU Polaris Mentorship Course

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- Participated in and facilitated mentee-focused in-class discussions on topics including imposter syndrome, science communication, and diverse perspectives in STEM
- Closely mentored 2 students per year (totaling 4) of the Mentorship Course in psychosocial mentoring, academic
  advising, professional development, and exploration of topics in physics and astronomy
- Designed 8-hour self-led research projects for each mentee including interactive lessons, introductions to Python programming, and research poster development
- Created undergraduate project cookbooks posted on GitHub for future mentors to follow

#### Course Design Institute Attendee

February 2024

OSU Drake Institute for Teaching and Learning

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Attended 12 hours of guided workshop about designing effective course curriculum

- Designed a one-semester course for advanced undergraduates in Astroparticle Physics Research Methods
- Created scaffolded lesson plans, learning goals, and assessments for the course

## URSA Academic Facilitator (AF)

April 2023 - October 2023

OSU Polaris



- Designed and presented interactive physics and astronomy-based curriculum centered around the theme of dark matter for a 2-week early-arrival program for incoming undergraduates
- Mentored 14 students from underrepresented backgrounds in science identity, self-efficacy, and sense of belonging
- Taught 8 self-designed one-hour classes on fundamental physics, computational resources, scientific reasoning, and dark matter astrophysics
- Provided teaching support on 8 of fellow AF's classes during lessons
- Led AF administrative work including planning meeting, scheduling classes, and keeping records on developments of lesson plans and teaching materials
- Created surveys and collected student feedback on URSA program classes and activities
- Authored formal report on URSA program design and implementation for use in reporting to department stakeholders





#### WORKSHOPS

• 4th Santa Cruz School on Multi-messenger Astrophysics Santa Cruz, CA

July 2025

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#### **PRESENTATIONS**

• Student Talks at Network for Neutrinos, Nuclear Astrophysics, and Symmetries Santa Cruz, CA

July 2025

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• Phenomenology 2025 Symposium *Pittsburgh, PA* 

May 2025

• 2025 Edward F. Hayes Advanced Research Forum

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Columbus, OH
• Department of Physics Graduate Student Research Poster Session

February 2025

 Department of Physics Graduate Student Research Poster Session Columbus, OH September 2023

# **ADDITIONAL INFORMATION**

Advanced Graduate Coursework: Numerical and Statistical Methods in Astronomy, Order of Magnitude Astronomy, Learning from Data: Bayesian Methods for Physicists

**Programming Languages:** Python, Mathematica, LaTeX **Languages:** English (native fluency), Spanish (native fluency)