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*
  Pennsylvania State University — State College, PA
  - 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.)** — *June 2024 - July 2024*
  Solar Physics [GitHub]
- **A ν look at the Sun: Probing the conditions of the solar core using ^{8}B neutrinos** — *September 2023 - April 2025*
  Solar Neutrino Astrophysics [GitHub]
- **Constraining Metastable Very Heavy Dark Matter using the Extragalactic γ-Ray Background** — *June 2021 - July 2022*
  Dark Matter Astrophysics

Publications

C=Conference, J=Journal, S=In Submission, T=Thesis

[S.1] Zaidel, M. A. and Beacom, J. F. (2025). **A ν 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 [Globe]
  - 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*
  OSU CCAPP ASPIRE [Globe]
  - 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 [Globe]
  - 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
  - Met with students individually to advise them on research tasks, presentations, and career development

- **Workshop Presenter** *Summer 2024*
  OSU Summer Undergraduate Research Program in Astrophysics (SURP) [🌐]
  - 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 [🌐]
  - Attended training on creating effective mentoring relationships between graduate and undergraduate students
  - 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 [🌐]
  - 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** *July 2025*
  Santa Cruz, CA [🌐]

Presentations

- **Student Talks at Network for Neutrinos, Nuclear Astrophysics, and Symmetries** *July 2025*
  Santa Cruz, CA [🌐]
- **Phenomenology 2025 Symposium** *May 2025*
  Pittsburgh, PA [🌐]
- **2025 Edward F. Hayes Advanced Research Forum** *February 2025*
  Columbus, OH
- **Department of Physics Graduate Student Research Poster Session** *September 2023*
  Columbus, OH

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)