Petra Mengistu
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EDUCATION

University of California, Santa Cruz, Santa Cruz, California — Sep 2024 - Present
PhD student in Astronomy and Astrophysics
Haverford College, Haverford, Pennsylvania — Aug 2020 - May 2024
Bachelor of Science (BSc) in Astrophysics
Current Undergraduate Thesis: The Role of Galactic Bars on Star Formation

RESEARCH EXPERIENCE

University of Oxford, Department of Astrophysics — Oxford, UK
Haverford College Marian E. Koshland Integrated Science Center External Research Scholar — Jul 2023 - Sep 2023

- Conducted research investigating morphological quenching driven by bars in both star-forming and quenching galaxies supervised by Professor Chris Lintott, Dr. Rebecca Smethurst, and Professor Karen Masters.
- Generated radial profiles of various spectroscopic tracers of quenching in barred galaxies.
- Attended weekly seminars on various topics in Astronomy, including characterization of exoplanet atmospheres, black hole transients, and astrophotonics.

Haverford College, Department of Physics and Astronomy — Haverford, USA
Velay Scholar at the Marian E. Koshland Integrated Science Center (KINSC) — May 2022 - Aug 2022

- Worked on two independent research projects concurrently over a ten-week period with Professor Walter Smith and Professor Karen Masters.
- Designed and ran the initial testing of atmospheric water collection using a Quartz Crystal Microbalance. Refined experimental setup to incorporate coaxial cylindrical electrodes, achieving an increased theoretical water collection efficiency.
- Isolated relevant physical properties contributing to the observed dependence of correlation of arm winding and bulge size. Presented these findings at the KINSC annual symposium and at the 241st AAS meeting.
- Developed analytical skills to interpret results on arm winding in relation to current theories of spiral arm formation mechanisms and published a Research Note on this work.
- Contributed to weekly HI data reduction sessions of the research group aimed at reducing the raw data obtained from 2016-2022 Green Bank Telescope observations.

Haverford College, Department of Physics and Astronomy — Haverford, USA
Undergraduate Research Scholar — May 2021 – Aug 2021

- Worked on a 10 week research project mentored by Professor Karen Masters.
- Determined the correlation between arm winding and bulge size in various subsets of spiral galaxies. Analyzed the impact of physical galactic properties on this correlation.
- Engaged in weekly group meetings and journal club that covered a range of topics on galaxy evolution and morphology, citizen science, and strategies for scientific communication.

TEACHING AND MENTORING

Teaching Assistant, Department of Physics and Astronomy — *Haverford College, USA* — Sep 2021 - May 2024

- Served as a student assistant to the Introductory Physics courses (Classical Mechanics and Electricity and Magnetism). Currently work as an assistant to the Introductory Astrophysics course.
- Host office hours twice a week to support students with weekly assignments and lectures. Develop effective problem solving techniques and broader study strategies with students.
- Lead observing laboratory sessions for students in the introductory Astrophysics course with the 12" optical telescope.

Peer STEM Academic Coach, Office of Academic Resources *Haverford College, USA* — Nov 2022 - May 2024

- Support historically marginalized students in introductory STEM courses and serve as a resource to uncover the hidden curriculum in these courses.
- Mentor students in the process of navigating STEM courses by developing study strategies, time management skills, and planning experience.
- Received extensive training in the process of coaching students.

Writing Center Peer Tutor — *Haverford College, USA* — Sep 2021 - May 2024

- Assisted students with writing assignments, presentations, and fellowship and internship applications.
- Organized workshops on linguistic justice and effective skills for public speaking and communication.
- Facilitated joint sessions with the International Student Support Office to promote engagement with the Writing Center.
- Hosted collaborative writing workshops over the course of the 2022 summer for students at Haverford working on research projects and fellowship applications.

Physics Tenure Track Professor Search Committee — Haverford College, USA Sep 2023 - Dec 2023

- Assessed the entirety of candidate dossiers and assisted in the process of interviewing candidates.
- Organize activities for student interaction with selected candidates by hosting a journal club session and joint lunch.
- Facilitate the inclusion of student feedback in the evaluation and selection process of candidates as a student representative on the committee.

Organizing Committee Member of Public Observing Team — *Haverford College, USA* Feb 2023 - May 2024

- Promote astronomy outreach to the broader Haverford/Bryn Mawr residential community as well as students and faculty of both colleges.
- Plan and host events at Strawbridge Observatory for the public to observe various astronomical objects using the 8", 12", and 16" optical Cassegrain telescopes.
- Organize and lead adjacent craft sessions, presentations, panels, and space-themed demos to engage a variety of audiences in Astronomy.

International Student Resource Person — *Haverford College, USA* Jun 2021 - Sep 2022

- Facilitated orientation program for incoming international first year students.
- Serve as an informational resource throughout the program and school year. Provide support for students transitioning into a new environment (academically and culturally) and connections to various offices and resources at Haverford College.

PUBLICATIONS AND PRESENTATIONS

Mengistu, Petra, Rebecca J. Smethurst, Chris Lintott, and Karen L. Masters. "Bars and Quenching." *2023 Conference Proceedings of the Keck Northeast Astronomy Consortium.*

- Presented a talk at the 2023 KNAC symposium hosted at Wesleyan University and at the 2023 KINSC symposium.
- Paper currently in progress.

Mengistu, Petra and Karen L. Masters. "Mass and Color Dependence of the Hubble Spiral Sequence." *Research Notes of the American Astronomical Society, Volume 7, Number 3.* https://iopscience.iop.org/article/10.3847/2515-5172/acc032

- Presented poster on this work at the 241st meeting of the American Astronomical Society, the 2021 Keck Northeast Astronomy Consortium Annual Symposium, and the Marian E. Koshland Integrated Natural Sciences Symposium.
- Discussed findings and relevance in the American Astronomical Society youtube series: https://www.youtube.com/watch?v=MEKAycr976I. Reached 2nd most viewed episode within recent releases.

ACTIVITIES

- **Caltech FUTURE of Physics 2023 Cohort Attendee** (*2023*)
- **Underrepresented Minorities in STEM**, Committee Member (*2023*)
- **Gender Underrepresented in Astronomy and Physics**, Member (*2022-23*)
- **Tri-Co Multilingual Workshop Series Student Organizer**: Representative for Haverford, Bryn Mawr, and Swarthmore Colleges and organized series of workshops on importance of linguistic justice on each of these campuses. (*2023*)
- **Institutional Advancement Student Worker**: assisted process of raising donations for various offices at Haverford College, including funding to support students on financial aid. (*2021*)

HONORS AND AWARDS

- KINSC External Research Summer Scholar 2023
- Class of '78 Scholarship 2023
- KINSC Velay Scholar 2022
- Class of '78 Scholarship 2022
- Class of '78 Scholarship 2021

SKILLS

- **Relevant Coursework:** Introductory Classical Mechanics, Introductory Electricity and Magnetism, Waves and Oscillations, Introduction to Quantum Mechanics, Scientific Computing, Introduction to Astrophysics, Observational Astronomy, Advanced Classical Mechanics, Advanced Quantum Mechanics, Computational Physics, Statistical Mechanics, General Relativity
- **Programming and Software:**
  - *Proficient*: Python, Mathematica, LaTeX, AstroImageJ.
  - *Familiar with:* Matlab, Git, Java.