Emily Koivu

Curriculum Vitae

Physics Research Building
Office M2000
191 W Woodruff Ave
Columbus, OH 43210
koivu.1@osu.edu

I am a dissertation-year PhD student studying cosmology with an emphasis on dark matter, gravity, high-energy gas dynamics, and cosmic dawn. Much of my work is at the intersection of theory and observation. I am deeply interested in pursuing further numerical and modeling work as it relates to cosmological dark matter phenomenology and strong gravitational systems.

Education

July '22 – July '26 **Ph.D. in Physics**, The Ohio State University,
Under supervision of Dr. Christopher Hirata,
Dissertation: *"Primordial Black Holes and Cosmic Dawn"*

Aug '20 – June '22 **Masters in Physics**, The Ohio State University,
Candidacy: "*Imaging with Germanium Compton Telescopes*"

Aug '16 – May '20 **B.S. in Physics, B.A. Applied Math**, Emory University

Awards

- **Department of Energy SCGSR Fellowship**
  Fermi National Accelerator Lab June-Dec 2024
  Selected for research experience in residency at DOE National Lab to advance thesis projects under the supervision of Dr. Nick Gnedin
- **OSU Physics Service Award 2023**
  Presented to graduate students for dedication and excellence in department service positions

Publications

- **E. Koivu**, et al., "Impacts of PBH Hawking Radiation on IGM History," *coming soon (weeks), submitting to JCAP*
- **E. Koivu**, et al., "Hawking Radiation from PBHs: Regularization," *coming by application timescale, submitting to PRD*
- A. Harbo-Torres, **E. Koivu**, et al., "Cosmic Ray Simulations for Roman," *coming in Fall*
- **E. Koivu**, et al., "Corrections to Hawking Radiation from Asteroid Mass Primordial Black Holes: Numerical evaluation of dissipative effects," *Phys. Rev. D* **111**, 045011, (2025)
- G. Vasquez, J. Kushan, M. Silva, **E. Koivu**, et. al., "Corrections to Hawking Radiation from Asteroid Mass Primordial Black Holes: description of the stochastic charge effect in quantum electrodynamics" *arXiv:* 2407.09724, (2024)
- M. Silva, G. Vasquez., **E. Koivu**, et al., "Corrections to Hawking Radiation from Asteroid Mass Primordial Black Holes: I. Formalism of Dissipative Interactions in Quantum Electrodynamics" *Phys. Rev. D* **107**, 045004, (2023)
- Y. Yang, **E. Koivu**, et. al., "Lyman-α polarization from cosmological ionization fronts. Part I. Radiative transfer simulations," *JCAP* 05 (2023) 041

- **E. Koivu**, et. al., "Lyman-α polarization from cosmological ionization fronts. Part II. Implications for intensity mapping," *JCAP* 05 (2023) 042

Teaching Experience

Summer '25 **Academic Facilitator**, Undergraduate Residential Summer Access Program, The Ohio State University
Develop Curriculum and Programming for incoming first-year undergraduate physics students with the purpose of creating community and self-efficacy for historically underrepresented groups in physics

Spring '22 **Head Graduate Teaching Assistant**, Physics 1251, The Ohio State University, *Calculus-Based Introductory Electricity and Magnetism*

Spring '21 - Fall '22 **Head Graduate Teaching Assistant**, Physics 1250, The Ohio State University, *Performed teaching duties as well as coordinating course adjustments with administrators, modifying course delivery, and managing other GTAs*

Fall '20 **Graduate Teaching Assistant**, Physics 1250, The Ohio State University, *Calculus-Based Introductory Classical Mechanics*

Conferences

- Submitting to AAS January Meeting 2026
- UCLA Dark Matter Conference *Poster Presenter*, Los Angeles, CA, March 2025
- APS Global Summit Conference *Talk*, Anaheim, CA, March 2025
- Picture an Astronomer Symposium attendee, virtual, March 2025
- AAS January Meeting Conference *Poster Presenter*, Washington, DC, Jan 2025
- New Horizons in Primordial Black Hole physics *Talk* Edinburgh, Scotland June 2024
- Reionization in the Summer Conference *Poster Presenter*, Heidelberg, Germany, June 2023
- AAS January Meeting Conference attendee, Seattle, WA, Jan 2023
- APS Advancing Graduate Leadership Professional Development Skills Workshops for Women and other Gender Minorities, Washington, DC, Aug 2022

Service

Summer '25 **Undergraduate Residential Summer Access Program Academic Facilitator**

Summer '23, Summer '25 **Classics Journal Club Co-creator and Organizer**, *Began Journal Club dedicated to foundational papers in Astrophysics and Cosmology*

Aug '22- Aug '23 **Cosmolunch Coordinator**, *Facilitated Cosmology Journal Club*

May '22- May '23 **Society of Women in Physics**, President

Aug '21- Aug '23 **Mentoring for First Year Graduate Students**

Aug '20 - Aug '23 **Physics Graduate Student Council**, Representative

Advanced Courses

- **Numerical and Statistical Methods in Astrophysics** Astronomy course
- **Dynamics** Astronomy course
- **Quantum Field Theory I and II** Physics course
- **Radiative Transfer** Astronomy course, audited

References

- **Professor Chris Hirata**, hirata.10@osu.edu
- **Professor Nick Gnedin**, gnedin@uchicago.edu
- **Professor Annika Peter**, peter.33@osu.edu