Emma Jane Weller

emma.weller@yale.edu

0009-0000-6612-0599

Education

Yale University – 2024-present
Ph.D. Candidate in Astronomy
Thesis Advisor: Prof. Priyamvada Natarajan

Harvard University – 2020-2024
A.B. in Physics and Astrophysics
Summa Cum Laude, GPA: 4.00

Fellowships & Awards

⋆ **Sigma Xi Honor Society** – 2026
⋆ **National Science Foundation Graduate Research Fellowship** – 2024
⋆ **Sterling Prize Fellowship** *(Yale University)* – 2024
⋆ **Summa Cum Laude** *(Harvard University)* – 2024
⋆ **Highest Honors in Physics** *(Harvard University)* – 2024
⋆ **Phi Beta Kappa Honor Society** – 2024
⋆ **Sophia Freund Prize** for the highest ranking undergraduates *(Harvard University)* – 2024
⋆ **Carol Davis Prize** for exceptional service to the physics community *(Harvard University)* – 2024
⋆ **Harvard College Office of Undergraduate Research and Fellowships Conference Funding** – 2023 (twice)
⋆ **Harvard College Research Program Fellowship** – 2022, 2023
⋆ **John Harvard Scholarship** for students in the top 5% of their class *(Harvard University)* – 2021, 2022, 2023
⋆ **Detur Prize** for sophomores with very high academic standing *(Harvard University)* – 2022
⋆ **Program for Research in Science and Engineering Fellowship** *(Harvard University)* – 2021

Research Experience

⋆ **Thesis Research** (Department of Astronomy, Yale University)

- *Advisor:* Prof. Priyamvada Natarajan
- Beginning work on my thesis, which will focus on massive black holes that wander off-center in their host galaxies due to minor galaxy mergers

⋆ **Second-Year Theory Project** (Department of Astronomy, Yale University)

- *Advisor:* Prof. Priyamvada Natarajan
- Used the cosmological simulations ASTRID and IllustrisTNG to investigate how the evolutionary histories of massive black holes impact their growth relative to their host galaxies

⋆ **First-Year Observational Project** (Department of Astronomy, Yale University)

- *Advisor:* Prof. Pieter van Dokkum
- Used Hubble imaging to study the orientation of radio jets relative to nuclear dust features in early-type galaxies

⋆ **Undergraduate Research** (Center for Astrophysics | Harvard & Smithsonian)

- *Advisor:* Dr. Fabio Pacucci
- Used the cosmological simulations ASTRID and IllustrisTNG to study wandering intermediate-mass black holes, over-massive central black holes, and high-redshift massive galaxy quenching

Publications

6. **Weller E. J.,** Natarajan P., Burke C. J., Dattathri S., *Tracing Black Hole and Galaxy Growth Across Environments Since Cosmic Noon,* 2026, under review at ApJ

5. **Weller E. J.,** van Dokkum P., *The Perpendicularity of Dust Lanes and Radio Jets in Early-type Galaxies: Implications for Active Galactic Nuclei Feedback,* 2026, ApJ, 999, 33, 10.3847/1538-4357/ae3dda

4. **Weller E. J.,** Pacucci F., Ni Y., Hernquist L., Park M., *Discrepancies between JWST Observations and Simulations of Quenched Massive Galaxies at $z > 3$: A Comparative Study with IllustrisTNG and ASTRID,* 2025, ApJ, 979, 181, 10.3847/1538-4357/ada360

3. **Weller E. J.,** Pacucci F., Natarajan P., Di Matteo T., *Over-massive Central Black Holes in the Cosmological Simulations ASTRID and Illustris TNG50,* 2023, MNRAS, 522, 4963, 10.1093/mnras/stad1362

2. **Weller E. J.,** Pacucci F., Ni Y., Chen N., Di Matteo T., Siwek M., Hernquist L., *Orbital and Radiative Properties of Wandering Intermediate-Mass Black Holes in the ASTRID Simulation,* 2023, MNRAS, 520, 3955, 10.1093/mnras/stad347

1. **Weller E. J.,** Pacucci F., Hernquist L., Bose S., *Dynamics of Intermediate-Mass Black Holes Wandering in the Milky Way Galaxy Using the Illustris TNG50 Simulation,* 2022, MNRAS, 511, 2229, 10.1093/mnras/stac179

Presentations

⋆ **Massive Black Holes Across Cosmic Time** *(Kavli Institute for Cosmology, Cambridge)* – Sept. 2025
⋆ **Prospects in Theoretical Physics** *(Institute for Advanced Study)* – July 2025
⋆ **Astronomy Club Guest Speaker** *(Mount Si High School; virtual)* – Jan. 2025
⋆ **243rd Meeting of the American Astronomical Society** *(New Orleans, LA)* – Jan. 2024
⋆ **Boston-Area Black Hole Accretion Meeting** *(Harvard University)* – Oct. 2023
⋆ **Harvard-Heidelberg Star Formation Workshop** *(Harvard University)* – Oct. 2023
⋆ **242nd Meeting of the American Astronomical Society** *(Albuquerque, NM)* – June 2023
⋆ **241st Meeting of the American Astronomical Society** *(Seattle, WA)* – Jan. 2023
⋆ **240th Meeting of the American Astronomical Society** *(Pasadena, CA)* – June 2022
⋆ **Undergraduate Research Spotlight** *(Harvard University)* – Mar. 2022
⋆ **Black Holes Across Space and Time Workshop** *(Black Hole Initiative; virtual)* – Dec. 2021

Teaching Experience

⋆ Teaching Fellow – Astronomy 1800: Introduction to Relativity and Black Holes – Yale University – Fall 2025
⋆ Teaching Fellow – Astronomy 220: Galaxies and Cosmology – Yale University – Spring 2025
⋆ Teaching Fellow – Astronomy 110: Planets and Stars – Yale University – Fall 2024
⋆ Course Assistant – Astronomy 16: Stellar and Planetary Astronomy – Harvard University – Spring 2023, 2024
⋆ Coach – Wintersession Python Introduction – Harvard University – January 2021

Mentoring & Community

⋆ Mentor and Organizing Committee Member – Yale First-Year Astronomy Buddy Program – Summer 2025 - present
⋆ Mentor for undergraduate astronomy students – Yale AstroSibs Program – Fall 2024 - present
⋆ Member – Yale Astronomy Climate and Diversity Committee – Fall 2024 - present
⋆ Co-advisor for high school student – Choate Rosemary Hall Science Research Program – Summer 2025
⋆ Assistant Instructor – Yale Astronomy Research Preparation Series – Spring 2025
⋆ Mentor for beginning undergraduate astronomy students – Harvard AstroSoc – Fall 2023 - Spring 2024
⋆ Events and Panels Chair – Harvard Society of Physics Students – Fall 2021 - Spring 2024