

Pei-Jun Huang

they/them

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EDUCATION

Brown University, Providence, RI
Sc.B. in Physics, Astrophysics track

Physics GPA: 3.85
Expected May 2026

RELEVANT COURSEWORK

Undergrad-level: Cosmology, Stellar Structure, Advanced EM, Quantum Mech A&B, Stat Mech, Data Science, Data Structure & Algorithms.

Graduate-level: General Relativity, Advanced Astrophysics & Observational Cosmology, Applied AI & Machine Learning in Physics, Solid State Physics.

RESEARCH EXPERIENCE

Gravitational Lensing and Astrophysics Group, Brown University Nov. 2022 - present
PI: Ian Dell'Antonio

- Obtained new measurement of the half-light radius of the Tucana dwarf spheroidal galaxy, based on Local Volume Complete Cluster Survey (LoVoCCS) and Hubble Legacy imaging results.
- Processed DECam imaging data for LoVoCCS to extract weak gravitational lensing signal using LSST Science Pipelines.

Shandera Quantum Group, Penn State University May - Aug. 2025
PI: Sarah Shandera

- Achieved non-equilibrium steady states in quantum circuits evolved with non-Markovian gate sequences, opening new avenue for such out-of-equilibrium dynamics, which is only dependent on circuit architecture. Studied connections from open quantum systems to quantum cosmology.

CMB Group, KIPAC, SLAC National Lab, Stanford University Jun. - Aug. 2024
PI: Kimmy W.L. Wu

- Trained neural network emulators of theoretical CMB spectra and BAO observables. Emulators uniquely account for cosmological properties of neutrinos and are hundreds of times faster than traditional CAMB predictions.
- Produced preliminary constraints on the sum of neutrino masses achievable by CMB-S4 and DESI BAO measurements.

PUBLICATIONS

- **P.-J. Huang**, I. Dell'Antonio, P. LaDuca, Z. Escalante, A. Englert, "Measurement of the Half-Light Radius for the Tucana Spheroidal Dwarf Galaxy," 2025, arXiv: [2512.12027](#).
- U. Akhouri, **P.-J. Huang**, E. Rose, S. Shandera., "Operator dynamics in k-Markov random circuits," 2026, arXiv: [2603.18217](#).

PRESENTATIONS

- **P.-J. Huang**, U. Akhouri, and S. Shandera. "Non-Markovian quantum circuits can exhibit non-equilibrium steady states." Poster presented at Quantum Gravity, Penn State University, July 2025.

- **P.-J. Huang**, I. Dell’Antonio, P. LaDuca, Z. Escalante, A. Englert. “Measurement of the Half-Light Radius for the Tucana Spheroidal Dwarf Galaxy.” Poster presented at APS New England Sectional Meeting, Providence, RI, November 2025.
- **P.-J. Huang**, I. Dell’Antonio, P. LaDuca, Z. Escalante, A. Englert. “Measurement of the Half-Light Radius for the Tucana Spheroidal Dwarf Galaxy.” Accepted upcoming poster presentation at the 247th Meeting of American Astronomical Society, Phoenix, AZ, January 2026.

TEACHING & OUTREACH SERVICES

- Teaching Assistant** for Astronomy & Astrophysics, Brown Physics Dept. Jan. 2023 - present
- Coordinated CCD deep sky imaging, solar observing, telescope basics, and spectroscopy labs for students, at the Barus & Holley Observatory. Assisted with telescope operation.
 - Facilitated problem-solving workshops to guide students on understanding course content.
- Teaching Assistant** for General Relativity, Brown Physics Dept. Jan 2026 - present
- Hold weekly office hours for undergraduate and graduate students. Prepare exam review sessions.
- Leader of Astronomy Club**, Brown University Jan. 2023 - present
- Coordinate galaxy, comet, planetary, solar, and lunar observing events at Brown’s Barus & Holley Observatory and historical Ladd Observatory.
 - Facilitate astronomy outreach with local community through in-person events and social media.
- AstroFest Volunteer**, Penn State University Jul. 2025
- Operated telescopes for public viewing, managed remote observation activity, engaged public in stargazing and astrophysical outreach.
- LunaSCOPE Ambassador**, Brown University Apr. 2024
- Operated and set up H-alpha telescopes for public eclipse-viewing outreach event.

GRANTS/AWARDS

- Undergraduate Teaching & Research Award**, Brown University, \$2500 May - Sep. 2023
- Awarded for research project titled “Mapping Dark Matter” under Professor Dell’Antonio.

SKILLS

Computer: Python (Astropy, PyTorch, scikit-learn), Java, ReasonML, C/C++, Unix, HTML/CSS, high-performance computing, LaTeX.

Languages: English (native-level), Mandarin Chinese (native-level), French (intermediate).

REFERENCES

Ian Dell’Antonio — Professor of Physics, Brown University.

Email: ian_dellantonio@brown.edu

Sarah Shandera — Professor of Physics, The Pennsylvania State University.

Email: ses47@psu.edu

W. L. Kimmy Wu — Assistant Professor of Physics, The California Institute of Technology.

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