Yuanze Luo

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ABOUT ME

I'm a Ph.D. candidate in Astronomy and Astrophysics at Johns Hopkins University with research interests covering a wide range of topics related to galaxy evolution and active galactic nuclei (AGN). I've been investigating the effects of AGN on the star formation of their host galaxies and the differences in the multiphase interstellar medium of various types of AGN-host galaxies. My studies take advantage of multi-wavelength data from X-ray to radio and my expertise includes analyzing interferometry, imaging, space- and ground-based spectroscopy data as well as statistical techniques.

EDUCATION

Johns Hopkins University *Aug 2019 - present*
Ph.D. candidate in Astronomy and Astrophysics

University of Illinois at Urbana-Champaign *Aug 2015 - May 2019*
Bachelor of Science in Physics
Bachelor of Science in Astronomy
Minor in Computer Science

SKILLS

Technical	Python, Java, C++, R, LaTeX
Languages	English, Mandarin, Japanese
Hobbies	Piano, Violin

EXPERIENCE

Department of Physics and Astronomy at JHU
Graduate Research *Aug 2019 - present*

- Look for evidence of gas accretion to sustain star formation in galaxies by measuring and analyzing the anomaly of gas-phase metallicity in spatially resolved observations of nearby galaxies (SDSS IV - MaNGA survey).
  Supervisor(s): Prof. Tim Heckman
- Study behaviors of post-starburst galaxies focusing on the effects of AGN and outflows on quenching the star formation, utilizing multiwavelength observations from X-ray to radio.
  Supervisor(s): Dr. Kate Rowlands, Dr. Katherine Alatalo, Prof. Tim Heckman
- Investigate the ISM properties of type 1 and type 2 quasar host galaxies, testing the evolutionary link between different kinds of galaxies.
  Supervisor(s): Dr. Andreea O. Petric

Community Experience

- Serve as JHU-Space Telescope Science Institute (STScI) student liaison. Help students with questions concerning working with scientists at STScI; Host weekly meetings between JHU-STScI joint colloquium speakers and JHU students.
- Organize regular meetings within the research group; Help organize department-wide events such as new student orientation and student meetings with faculty candidates.

- Serve in the local organization committee for the 2024 Spring Symposium at STScI: *Recipes to Regulate Star Formation at All Scales: From the Nearby Universe to the First Galaxies.*
- Member of Women In Physics JHU.

Graduate Teaching Assistant *Aug 2019 - May 2020*

- Lead problem-solving sections, office hours for students taking undergraduate general physics courses. Additional duties include proctoring exams, grading homework, writing homework solution manuals, and reviewing exam problems.
- Lead mechanics lab sections for students taking undergraduate general physics courses. Additional duties include grading lab reports, preparing presentation slides, and holding additional office hours to answer students' questions.

Astronomy Department at UIUC
Undergraduate Research *Jun 2017 - Jun 2019*

- Create visualizations for 126 galaxies in Extragalactic Database for Galaxy Evolution survey (EDGE) using Python packages yt and Plotly. http://mmwave.astro.illinois.edu/edgedata/
  Supervisors: Prof. Tony Wong, Dr. Mattew Turk
  NSF Award number: 1616199
- Work on improving the signal-to-noise ratio of CO observations using Hα velocity information, and generating radial profiles using the improved CO data for the 126 EDGE galaxies. Organize results in a series of Python notebooks.
  Supervisor: Prof. Tony Wong
  NSF Award number: 1616199
- Analyze differences in aspects such as light curve shapes and emission line properties for 977 extreme variability quasars selected from SDSS and DES data. Fit point-source-point-lens microlensing model to selected quasar light curves using the Markov chain Monte Carlo method.
  Supervisor: Prof. Yue Shen

Department Grader *Aug 2016 - May 2019*

- Grade assignments for undergraduate astronomy courses; answer students' questions about the homework.
- Help hold night and solar observing sections at the school observatory for students taking astronomy courses.
- Proctor exams for astronomy and physics courses.

NetMath at UIUC
Grader *Jun 2016 - Aug 2016*

- Grade online Mathematica-based assignments for students taking Calculus online courses.
- Cooperate with course teaching assistants to help students progress in the courses.

PUBLICATIONS

Refereed Journal Articles

- **Luo, Y.**, Shen, Y, Yang, Q, *Characterization of optical light curves of extreme variability quasars over a 16-yr baseline*, 2020, MNRAS, 494, 3686
- **Luo, Y.**, Heckman, T; Hwang, H et al., *Evidence for the Accretion of Gas in Star-forming Galaxies: High N/O Abundances in Regions of Anomalously Low Metallicity*, 2021, ApJ, 908, 183

- Sazonova, E., ... **Luo, Y** et al., *Are all post-starbursts mergers? HST reveals hidden disturbances in the majority of PSBs*, 2021, ApJ, 919, 134
- Abdurro'uf, ... **Luo, Y** et al., *The Seventeenth Data Release of the Sloan Digital Sky Surveys: Complete Release of MaNGA, MaStar, and APOGEE-2 Data*, 2022, ApJS, 259, 35
- **Luo, Y.**, Rowlands, K; Alatalo, K et al., *A Multiwavelength view of IC 860: What Is in Action inside Quenching Galaxies*, 2022, ApJ, 938, 63
- Otter, J., ... **Luo, Y** et al., *Resolved Molecular Gas Observations of MaNGA Post-starbursts Reveal a Tumultuous Past*, 2022, ApJ, 941, 93
- Boardman, N., ... **Luo, Y** et al., *SDSS-IV MaNGA: how do star-formation histories affect gas-phase abundances?*, 2023, MNRAS, accepted, eprint arXiv:2312.06196
- **Luo, Y.**, Petric, A.O. et al., *Measuring the ISM content of nearby, luminous, Type 2 QSOs through CO and [C II]*, 2024, under collaboration review
- Alatalo, A., ... **Luo, Y** et al., *Characterizing the Molecular Gas in Infrared Bright Galaxies with CARMA*, 2023, ApJ, submitted
- Wong, T., ... **Luo, Y** et al., *The EDGE-CALIFA Survey: An Extragalactic Database for Galaxy Evolution Studies*, 2023, AJ, submitted

Conference Proceedings

- **Luo, Y.**, *A Multiwavelength View of Black Holes and Outflows in Post-starburst Galaxies*, 2023, Proceedings IAU Symposium No. 378 Black hole winds at all scales

SELECTED PRESENTATIONS

- Contributed talk at Workshop on Chemical Abundances in Gaseous Nebulae: From The Milky Way to the Early Universe *(5/2021)*
- Press conference at AAS 239th meeting *(1/2022)*
- iPoster at AAS 240th meeting *(6/2022)*
- STScI-JHU AGN journal club talk *(11/2022)*
- Contributed talk at IAU 378 - Black hole winds at all scales *(3/2023)*
- The HotSci talk series at STScI *(7/2023)*

HONORS AND AWARDS

- Chambliss Astronomy Achievement Student Award Honorable Mention, 240th American Astronomical Society (AAS) meeting
- Summa Cum Laude and Highest Distinction in Physics Department at University of Illinois at Urbana-Champaign
- Summa Cum Laude and High Distinction in Astronomy Department at University of Illinois at Urbana-Champaign
- Bronze Tablet at University of Illinois at Urbana-Champaign upon graduation
- Member of James Scholar Honor Program at University of Illinois at Urbana-Champaign since Aug 2015
- Selected for College of Liberal Arts & Sciences Dean's List at University of Illinois at Urbana-Champaign in Fall 2015 semester, Spring 2016 semester, Fall 2016 semester, Fall 2017 semester

RELEVANT COURSES

Core Courses
Relativity & Math applications (UIUC)
Classical Mechanics I, II (UIUC)
Electromagnetic Fields I, II (UIUC)
Quantum Physics I, II (UIUC)
Thermal & Statistical Physics (UIUC)
Modern Experimental Physics (UIUC)
Stellar Astrophysics (UIUC)
Astronomical Techniques (UIUC)
Galaxies and the Universe (UIUC)
Scientific Writing for Astronomy (UIUC)
Radiative Astrophysics (JHU)
Interstellar Medium and Astrophysical Fluid Dynamics (JHU)
Stellar Structure and Evolution (JHU)
Astrophysical Dynamics (JHU)

Other Courses
Calculus I, II, III (UIUC)
Intro to Differential Eq Plus (UIUC)
Applied Linear Algebra (UIUC)
Statistics and Probability I (UIUC)
Data Structures (UIUC)
Numerical Methods I (UIUC)
Artificial Intelligence (UIUC)
Intro to Data Science (JHU)

EXTRA-CIRRUCULAR

- Violin player in Johns Hopkins Homewood Chamber Music Seminar and Hopkins Concert Orchestra
- Active member of University of Illinois Astronomy Society. Responsibilities include helping organize open house events, setting up telescopes, and participating telescope maintenance work
- Active member of Krannet Center Student Association. Volunteer usher at Krannert Center for the Performing Arts
- Tutor at Urbana High School. Worked with a local teacher in her homeroom and assisted students with homework problems in scientific subjects