Chang **Liu**

TIME-DOMAIN ASTRONOMER

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"Explore the universe, benefit the society."

Education

GRADUATE STUDENT Department of Physics and Astronomy, Northwestern University *Sep 2021 –*

- Advisor: Adam A. Miller

MASTER OF SCIENCE Department of Physics and Astronomy, Northwestern University *Sep 2021 – Jun 2023*

BACHELOR OF SCIENCE (HON) Department of Astronomy, Peking University *Sep 2016 – Jun 2020*

- Thesis: *The Hydrodynamics of Binary Mass Transfer in Compact Binaries*
- Advisors: Enrico Ramirez-Ruiz & Xian Chen

Research Interests

- Exploring the transient sky with time-domain surveys (ZTF & LS4), data science, and numerical simulations
- **Type Ia supernovae (SNe Ia)**: constraining their ignition mechanism and progenitor systems by (i) investigating the most peculiar individual events; (ii) inferring population-level properties of normal SNe Ia in a data-driven way
- **Tidal disruption events (TDEs)**: modeling bizarre repeaters near massive black holes using hydrodynamical simulations

Research Positions

Research Assistant Peking University *Sep 2020 – Jul 2021*

Undergraduate Research Intern University of California, Santa Cruz *Oct 2019 – Jan 2020*

Summer Undergraduate Research Fellowship (SURF) California Institute of Technology *Jun 2019 – Aug 2019*

Undergraduate Research Fellow Peking University *Jul 2018 – Jun 2020*

Publications

- **C. Liu**, A. A. Miller, S. J. Boos, et al., SN 2022JOJ: A PECULIAR TYPE IA SUPERNOVA POSSIBLY DRIVEN BY AN ASYMMETRIC HELIUM-SHELL DOUBLE DETONATION, *2023, ApJ, 958, 178.*
- **C. Liu**, A. A. Miller, A. Polin, et al., SN 2020JGB: A PECULIAR TYPE IA SUPERNOVA TRIGGERED BY A HELIUM-SHELL DETONATION IN A STAR-FORMING GALAXY, *2023, ApJ, 946, 83.*
- **C. Liu**, B. Mockler, E. Ramirez-Ruiz, et al., TIDAL DISRUPTION EVENTS FROM ECCENTRIC ORBITS AND LESSONS LEARNED FROM THE NOTEWORTHY ASASSN-14KO, *2023, ApJ, 944, 184.*
- **C. Liu**, X. Chen, & F. Du, IMPACT OF AN ACTIVE SGR A* ON THE SYNTHESIS OF WATER AND ORGANIC MOLECULES THROUGHOUT THE MILKY WAY, *2020, ApJ, 899, 2.*
- K. Das, C. Fremling, M. Kasliwal, et al. (including **C. Liu**), SN 2023ZAW: AN ULTRA-STRIPPED, NICKEL-POOR SUPERNOVA FROM A LOW-MASS PROGENITOR, *2023, submitted to ApJL.*
- P. Chen, A. Gal-Yam, J. Sollerman, et al. (including **C. Liu**), A 12.4 DAY PERIODICITY IN A CLOSE BINARY SYSTEM AFTER A SUPERNOVA, *2023, Nature, 625, 7994, 253-258.*
- Z. Wu, S. Dong, T. Yi, et al. (including **C. Liu**), GAIA22DKVLB: A MICROLENSING PLANET POTENTIALLY ACCESSIBLE TO RADIAL-VELOCITY CHARACTERIZATION, *2023, submitted to ApJ.*
- G. Dimitriadis, K. Maguire, V. R. Karambelkar, et al. (including **C. Liu**), SN 2021ZNY: AN EARLY FLUX EXCESS COMBINED WITH LATE-TIME OXYGEN EMISSION SUGGESTS A DOUBLE WHITE DWARF MERGER EVENT, *2023, MNRAS, 521, 1162.*

Telescope Proposals

PI Keck 10 m Telescopes, Northwestern ‖ 2 nights *2024B*

PI SEDMv2, Kitt Peak 2.1 m Telescope, Northwestern ‖ 42.5 hours *2024A*

PI SEDMv2, Kitt Peak 2.1 m Telescope, Northwestern ‖ 80 hours *2023B*

Observation Experience: Keck I (LRIS) ‖ 2 nights, Keck II (DEIMOS) ‖ 1 night

Talks & Posters

Talk 243rd AAS meeting *Jan 2024*
Talk The 32nd Texas Symposium on Relativistic Astrophysics *Dec 2023*
Talk Tsinghua University *Dec 2023*
Seminar Peking University *Dec 2023*
Talk ZTF 5th Science Meeting *Oct 2023*
Poster Keck Science Meeting *Sep 2023*
Seminar Tsung-Dao Lee Institute, Shanghai Jiao Tong University *Jun 2023*
Talk SPOKEN-WERRD 2022 Symposium *Nov 2022*
Talk ZTF 3rd Science Meeting *Oct 2022*
Talk PKU-DoA Undergraduate Astronomy Symposium *Sep 2020*

Skills

Languages Chinese, English
Programming **Proficient:** Python **Experienced:** Shell, Fortran, C/C++, SQL, HTML
Softwares
- sn_line_velocities (**developer**): fitting supernovae spectroscopic features with correlated Gaussian profiles
- Swift_ToO (**developer**): triggering and analyzing Swift UVOT follow-ups for interesting transients
- Pypeit: optical/NIR spectrum reduction
- Photoshop & Lightroom: as a shutterbug

Advising and Teaching

CIERA Scientist Mentor REACH Further (Indepdent Reseach Experience for REACH Students) *Aug 2023*
- Mentee: Isabella Chen

Teaching Assistant PHYSICS 333-2 (Advanced Electricity & Magnetism) *Sep 2022 – Dec 2022*
Teaching Assistant PHYSICS 130-2 (College Physics) *Jan 2023 – Mar 2023*
Teaching Assistant ASTRON 103-0-1 (Solar System) *Mar 2023 – Jun 2023*

Professional Service

Referee Astrophysical Journal Letters

Outreach

Presenter *Evanston, US*
Research Experience in Astronomy at CIERA for High School Students (REACH) *Jul 2023*
Invited Speaker (*supernovae: from the past to the future*) *Beijing, China*
Peking University Youth Astronomy Society (PKU-YAS) *Apr 2021*
Volunteer *Beijing, China*
Summer Camp of Astronomy for High School Students, Peking University *Jul 2018*

References

Prof. Adam A. Miller *Evanston, US*
amiller@northwestern.edu *Department of Physics and Astronomy, Northwestern University*
Prof. Enrico Ramirez-Ruiz *Santa Cruz, US*
enrico@ucolick.org *Department of Astronomy and Astrophysics, UC Santa Cruz*
Prof. Xian Chen *Beijing, China*
xian.chen@pku.edu.cn *Department of Astronomy, School of Physics, Peking University*