

Chang Liu

TIME-DOMAIN ASTRONOMER

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Education

PHD CANDIDATE 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 (Zwicky Transient Facility – **ZTF**; La Silla Schmidt Southern Survey – **LS4**), and merging observations with data science & 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 that are periodically stripped by 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

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

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

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

Honors & Awards

Oct 2020 **First prize & Lin-bridge Prize for Excellent Undergraduate Research (林桥奖学金)**, 2020 PKU-DoA Undergraduate Astronomy Symposium (endowed by Prof. Douglas Lin)

May 2020 **Outstanding graduate (北京市普通高校优秀毕业生)**, College Graduate Excellence Award of Beijing

May 2020 **Outstanding graduate (北京大学优秀毕业生)**, College Graduate Excellence Award of Peking University

Oct 2019 **Merit Student**, Annual honor of 2018-2019, School of Physics, Peking University

Oct 2019 **PKU Scholarship**, Annual scholarship of 2018-2019, School of Physics, Peking University

Jun 2019 **PKU Scholarship in Physics**, School of Physics, Peking University

Oct 2018 **Merit Student**, Annual honor of 2017-2018, School of Physics, Peking University

Oct 2018 **Wei Lin Scholarship**, Annual scholarship of 2017-2018, School of Physics, Peking University

Oct 2017 **Merit Student Pacesetter (the Utmost Annual Accolade at PKU)**, Annual honor of 2016-2017, School of Life Sciences, Peking University

Oct 2017 **Arawana Scholarship**, Annual scholarship of 2016-2017, School of Life Sciences, Peking University

Skills

Languages Chinese, English

Programming **Proficient:** Python **Experienced:** Shell, Fortran, C/C++, SQL

Softwares

- sn_line_velocities (**developer**): fitting supernovae spectroscopic features in a Bayesian way
- 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 (Independent Research 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

RESEARCH EXPERIENCE IN ASTRONOMY AT CIERA FOR HIGH SCHOOL STUDENTS (REACH)

Evanston, US

Jul 2023

Invited Speaker (*supernovae: from the past to the future*)

PEKING UNIVERSITY YOUTH ASTRONOMY SOCIETY (PKU-YAS)

Beijing, China

Apr 2021

Volunteer

SUMMER CAMP OF ASTRONOMY FOR HIGH SCHOOL STUDENTS, PEKING UNIVERSITY

Beijing, China

Jul 2018

References

Prof. Adam A. Miller

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Evanston, US

Department of Physics and Astronomy, Northwestern University

Prof. Enrico Ramirez-Ruiz

✉ ENRICO@UCOLICK.ORG

Santa Cruz, US

Department of Astronomy and Astrophysics, UC Santa Cruz

Prof. Xian Chen

✉ XIAN.CHEN@PKU.EDU.CN

Beijing, China

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