

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

Publications

- **C. Liu**, R. Yarza, & E. Ramirez-Ruiz., Repeating Partial Tidal Encounters of Sun-like Stars Leading to their Complete Disruption, *submitted to ApJ*.
- **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.
- Z. Wu, S. Dong, T. Yi, et al. (including **C. Liu**), Gaia22dkvLb: A Microlensing Planet Potentially Accessible to Radial-Velocity Characterization, 2024, *AJ*, 168, 62.
- K. Das, C. Fremling, M. Kasliwal, et al. (including **C. Liu**), SN 2023zaw: an ultra-stripped, nickel-poor supernova from a low-mass progenitor, 2024, *ApJL*, 969, L11.
- 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.
- 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) || 4 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

Poster Rise_Time 2024	Aug 2024
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
	<ul style="list-style-type: none"> 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
Softwares	<ul style="list-style-type: none"> Pyepit: 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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Department of Physics and Astronomy, Northwestern University

Prof. Enrico Ramirez-Ruiz

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Santa Cruz, US

Department of Astronomy and Astrophysics, UC Santa Cruz

Prof. Xian Chen

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Beijing, China

Department of Astronomy, Peking University