

# Chang Liu

TIME-DOMAIN ASTRONOMER

Department of Physics and Astronomy, Northwestern University, 2145 Sheridan Rd., Evanston, IL 60208, US

✉ ptg.cliu@u.northwestern.edu | 🌐 <https://slowdiveptg.github.io> | 📺 slowdivePTG

## 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 (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

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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

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**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

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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

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**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

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**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

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**Referee** Astrophysical Journal Letters

## Outreach

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### 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

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### Prof. Adam A. Miller

✉ AMILLER@NORTHWESTERN.EDU

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

Department of Astronomy, Peking University