

# Chang Liu

GRADUATE STUDENT, ASTRONOMY

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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, School of Physics, 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, and the incoming LS4 & LSST) and statistical/computational methods
- **Type Ia supernovae**: constraining the ignition mechanism and progenitor systems using both individual events of peculiarity and an unprecedented sample of the population
- **Tidal disruption events**: modeling bizarre repeaters near massive black holes using hydrodynamical simulations
- **Microlensing**: searching for wandering stellar-mass black holes in the Galactic plane

## 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, *submitted to ApJ*.
- **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 NOTE-WORTHY 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.
- 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, *Accepted by Nature*.
- 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.

## Talks

**ZTF 5th Science Meeting**

Pasadena, US

PECULIAR TYPE IA SUPERNOVAE FROM THE DETONATION OF A HELIUM SHELL

Oct 2023

**Keck Science Meeting**

Berkeley, US

UNVEILING EXPLOSION CHANNELS OF PECULIAR TYPE IA SUPERNOVAE AS THEY FADE (POSTER)

Sep 2023

## Astro Seminar, Tsung-Dao Lee Institute

TYPE IA SUPERNOVAE FROM THE DETONATION OF A HELIUM SHELL – FROM RARE WEIRDOS TO THE POPULATION

Shanghai, China

Jun 2023

## SPOKEN-WERRD 2022 Symposium

SN 2020JGB: A PECULIAR TYPE IA SUPERNOVA TRIGGERED BY A HELIUM-SHELL DETONATION

Virtual

Nov 2022

## Student Lightning Talk, ZTF 3rd Science Meeting

SN 2020JGB: A PECULIAR TYPE IA SUPERNOVA TRIGGERED BY A HELIUM-SHELL DETONATION

Evanston, US

Oct 2022

## PKU-DoA Undergraduate Astronomy Symposium

THE CHEMICAL IMPACT OF AN ACTIVE SGR A\* THROUGHOUT THE MILKY WAY

Beijing, China

Sep 2020

## Honors & Awards

Oct 2020	<b>First prize &amp; Lin-bridge Prize for Excellent Undergraduate Research (林桥奖学金)</b> , 2020 PKU-DoA Undergraduate Astronomy Symposium (endowed by Prof. Douglas Lin)
May 2020	<b>Outstanding graduate (北京市普通高校优秀毕业生)</b> , College Graduate Excellence Award of Beijing
May 2020	<b>Outstanding graduate (北京大学优秀毕业生)</b> , College Graduate Excellence Award of Peking University
Oct 2019	<b>Merit Student</b> , Annual honor of 2018-2019, School of Physics, Peking University
Oct 2019	<b>PKU Scholarship</b> , Annual scholarship of 2018-2019, School of Physics, Peking University
Jun 2019	<b>PKU Scholarship in Physics</b> , School of Physics, Peking University
Oct 2018	<b>Merit Student</b> , Annual honor of 2017-2018, School of Physics, Peking University
Oct 2018	<b>Wei Lin Scholarship</b> , Annual scholarship of 2017-2018, School of Physics, Peking University
Oct 2017	<b>Merit Student Pacesetter (the Utmost Annual Accolade at PKU)</b> , Annual honor of 2016-2017, School of Life Sciences, Peking University
Oct 2017	<b>Arawana Scholarship</b> , Annual scholarship of 2016-2017, School of Life Sciences, Peking University

## Skills

<b>Languages</b>	Chinese, English
<b>Programming</b>	<b>Proficient:</b> Python <b>Experienced:</b> Shell, Fortran, C/C++, HTML <ul style="list-style-type: none"><li>sn_line_velocities (<b>developer</b>): fitting supernovae spectroscopic features with correlated Gaussian profiles</li><li>Swift_ToO (<b>developer</b>): triggering and analyzing Swift UVOT follow-ups for interesting transients</li></ul>
<b>Softwares</b>	<ul style="list-style-type: none"><li>Pypeit: optical/NIR spectrum reduction</li><li>Photoshop: as a shutterbug</li></ul>

## 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

**Research Experience in Astronomy at CIERA for High School Students (REACH)**

Evanston, US

PRESENTER

Jul 2023

**Peking University Youth Astronomy Society (PKU-YAS)**

Beijing, China

INVITED SPEAKER (*supernovae: from the past to the future*)

Apr 2021

**Summer Camp of Astronomy for High School Students, Peking University**

Beijing, China

VOLUNTEER

Jul 2018

## References

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**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*

*Department of Astronomy, School of Physics, Peking University*