

# Claire Shi Ye

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## Education

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<b>Northwestern University, USA</b> Ph.D. Astronomy, Advisor: Frederic A. Rasio	August 2022
<b>Northwestern University, USA</b> M.Sc. Physics, Advisor: Melville P. Ulmer	2016
<b>Zhejiang University, China</b> B.Sc. Physics · GPA: 3.82	2015

## Honors & Awards

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<b>CITA Postdoctoral Fellowship</b>	2022-present
<b>IOP Publishing Top Cited Paper Award</b> For the article 'On the Rate of Neutron Star Binary Mergers from Globular Clusters', Ye, C. S., et al. 2020, <i>ApJL</i> , 888, L10-22. One of the most cited papers from North America published across the entire IOP Publishing journal portfolio for 2020-2022. Top 1% of most cited articles in the Astronomy and Astrophysics subject category.	2023
<b>IOP Publishing Top Cited Paper Award</b> For the article 'Modeling Dense Star Clusters in the Milky Way and Beyond with the CMC Cluster Catalog', Kremer, K., Ye, C. S., et al. 2020, <i>ApJS</i> , 247, 48. One of the most cited papers from North America published across the entire IOP Publishing journal portfolio for 2020-2022. Top 1% of most cited articles in the Astronomy and Astrophysics subject category.	2023
<b>Reach for the Stars Fellowship</b> GK-12 Program · Collaborated with a K-12 science classroom teacher to bring more inquiry-based teaching methods into the classroom; Developed interactive Python programs for astronomy classroom activities; Co-organizer and instructor for the first CIERA/Northwestern high school astronomy summer camp	2018-2019

## Publications

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38 total publications ([ADS Library](#)), including 8 first-author and 6 second-author (h-index=20).

### FIRST- AND SECOND-AUTHOR PAPERS

- Predicting the rate of fast radio bursts in globular clusters from binary black hole observations**  
Rao, A. (undergraduate student), [Ye, C. S.](#), & Fishbach, M. 2024, [arXiv:2409.20564](#)
- Can slow pulsars in Milky Way globular clusters form via partial recycling?**  
Kremer, K., [Ye, C. S.](#), Heinke, C. O. et al. 2024, [arXiv:2409.07527](#)
- Lower-mass-gap Black Holes in Dense Star Clusters**  
[Ye, C. S.](#), Kremer, K., Ransom, S. et al. 2024, *ApJ*, 975, 77
- The Redshift Evolution of the Binary Black Hole Mass Distribution from Dense Star Clusters**  
[Ye, C. S.](#) & Fishbach, M. 2024, *ApJ*, 967, 62
- The Dominant Mechanism(s) for Populating the Outskirts of Star Clusters with Neutron Star Binaries**  
Leigh, N. W., [Ye, C. S.](#), Grondin, S. M. et al. 2024, *MNRAS*, 527, 6913
- Single Millisecond Pulsars from Dynamical Interaction Processes in Dense Star Clusters**  
[Ye, C. S.](#), Kremer, K., Ransom, S. et al. 2024, *ApJ*, 961, 98

8. **On the Tidal Capture of White Dwarfs by Intermediate-mass Black Holes in Dense Stellar Environments**  
Ye, C. S., Fragione, G., & Perna, R. 2023, *ApJ*, 953, 141
7. **Millisecond Pulsars in Dense Star Clusters: Evolution, Scaling Relations, and the Galactic-Center Gamma-ray Excess**  
Ye, C. S. & Fragione, G. 2022, *ApJ*, 940, 162
6. **Formation of Low-mass Black Holes and Single Millisecond Pulsars in Globular Clusters**  
Kremer, K., Ye, C. S., Kiroğlu, F., et al. 2022, *ApJL*, 934, L1
5. **Compact Object Modeling in the Globular Cluster 47 Tucanae**  
Ye, C. S., Kremer, K., Rodriguez, C. L., et al. 2022, *ApJ*, 931, 84
4. **Modeling Dense Star Clusters in the Milky Way and Beyond with the CMC Cluster Catalog** (167 citations)  
Kremer, K., Ye, C. S., Rui, N. Z., et al. 2020, *ApJS*, 247, 48-91
3. **On the Rate of Neutron Star Binary Mergers from Globular Clusters** (132 citations)  
Ye, C. S., Fong, W-f., Kremer, K., et al. 2020, *ApJL*, 888, L10-22
2. **Millisecond Pulsars and Black Holes in Globular Clusters** (74 citations)  
Ye, C. S., Kremer, K., Chatterjee, S., et al. 2019, *ApJ*, 877, 122-131
1. **How Black Holes Shape Globular Clusters: Modeling NGC 3201** (70 citations)  
Kremer, K., Ye, C. S., Chatterjee, S., et al. 2018, *ApJL*, 855, L15-21

## REFEREED CO-AUTHOR PAPERS

18. **Investigating cannibalistic millisecond pulsar binaries using MESA: new constraints from pulsar spin and mass evolution**  
Misra, D., Linares, M., Ye, C. S. 2024, [arXiv:2408.16048](https://arxiv.org/abs/2408.16048)
17. **Gravitational Microlensing Rates in Milky Way Globular Clusters**  
Kiroğlu, F., Weatherford, N., Kremer, K., Ye, C. S., et al. 2022, *ApJ*, 928, 181
16. **Modeling Dense Star Clusters in the Milky Way and Beyond with the Cluster Monte Carlo Code**  
Rodriguez, C. L., et al. (including Ye, C. S.) 2022, *ApJS*, 258, 22
15. **White Dwarf Subsystems in Core-Collapsed Globular Clusters**  
Kremer, K., et al. (including Ye, C. S.) 2021, *ApJ*, 917, 28-46
14. **Matching Globular Cluster Models to Observations**  
Rui, N. Z., et al. (including Ye, C. S.) 2021, *ApJ*, 912, 102-118
13. **Fast Optical Transients from Stellar-Mass Black Hole Tidal Disruption Events in Young Star Clusters**  
Kremer, K., Lu, W., Piro, A. L., Chatterjee, S., Rasio, F. A., Ye, C. S. 2021, *ApJ*, 911, 104-116
12. **Intermediate-mass Black Holes from High Massive-star Binary Fractions in Young Star Clusters**  
González, E., et al. (including Ye, C. S.) 2021, *ApJL*, 908, L29-35
11. **Black Hole Mergers from Star Clusters with Top-Heavy Initial Mass Functions**  
Weatherford, N. C., Fragione, G., Kremer, K., Chatterjee, S., Ye, C. S., et al. 2021, *ApJL*, 907, L25-32
10. **Black Hole Mergers from Hierarchical Triples in Dense Star Clusters**  
Martinez, M. A. S., et al. (including Ye, C. S.) 2020, *ApJ*, 903, 67-83

9. **Populating the Upper Black Hole Mass Gap through Stellar Collisions in Young Star Clusters**  
 Kremer, K., et al. (including Ye, C. S.) 2020, *ApJ*, 903, 45-62
8. **Demographics of Triple Systems in Dense Star Clusters**  
 Fragione, G., Martinez, M. A. S., Kremer, K., Chatterjee, S., Rodriguez, C. L., Ye, C. S., et al. 2020, *ApJ*, 900, 16-38
7. **COSMIC Variance in Binary Population Synthesis**  
 Breivik, K., Coughlin, S. C., Zevin, M., Rodriguez, C. L., Kremer, K., Ye, C. S., et al. 2020, *ApJ*, 898, 71-84
6. **GW190412 as a Third-generation Black Hole Merger from a Super Star Cluster**  
 Rodriguez, C. L., et al. (including Ye, C. S.) 2020, *ApJL*, 896, L10-16
5. **The Optical Afterglow of GW170817: An Off-axis Structured Jet and Deep Constraints on a Globular Cluster Origin**  
 Fong, W-f., et al. (including Ye, C. S.) 2019, *ApJL*, 883, L1-9
4. **Black holes: The next generation-repeated mergers in dense star clusters and their gravitational-wave properties**  
 Rodriguez, C. L., et al. (including Ye, C. S.) 2019, *Phys. Rev. D*, 100, 043027:1-15
3. **Post-Newtonian dynamics in dense star clusters: Binary black holes in the LISA band**  
 Kremer, K., et al. (including Ye, C. S.) 2019, *Phys. Rev. D*, 99, 063003:1-12
2. **How Initial Size Governs Core Collapse in Globular Clusters**  
 Kremer, K., Chatterjee, S., Ye, C. S., et al. 2019, *ApJ*, 871, 38-49
1. **Post-Newtonian dynamics in dense star clusters: Formation, masses, and merger rates of highly-eccentric black hole binaries**  
 Rodriguez, C. L., et al. (including Ye, C. S.) 2018, *Phys. Rev. D*, 98, 123005:1-16

CONFERENCE PROCEEDINGS/RESEARCH NOTES

6. **No Black Holes in NGC 6397**  
 Rui, N. Z., et al. (including Ye, C. S.) 2021, *RNAAS*, 5, 47
5. **The Observed Rate of Binary Black Hole Mergers can be Entirely Explained by Globular Clusters**  
 Rodriguez, C. L., et al. (including Ye, C. S.) 2021, *RNAAS*, 5, 19
4. **The Role of "Black Hole Burning" in the Evolution of Dense Star Clusters**  
 Kremer, K., Ye, C. S., Chatterjee, S., et al. 2020, *IAU proceedings*, 351, 357
3. **Shaping Si, NiCo, and glass substrates via stresses in the coatings**  
 Wang, X., Yao, Y., Ye, C. S., et al. 2016, *SPIE Conference Series*, 9965, 99650D:1-9
2. **Toward large-area sub-arcsecond x-ray telescopes II**  
 O'Dell, S. L., et al. (including Ye, C. S.) 2016, *SPIE Conference Series*, 9965, 996507:1-17
1. **APERTURE: a precise extremely large reflective telescope using re-configurable elements**  
 Ulmer, M. P., et al. (including Ye, C. S.) 2016, *SPIE Conference Series*, 9904, 99041I:1-12

## Professional Service

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### Conference/Workshop Organizer

- CITA Postdoc Advance Workshop: Annual workshops focused on skill development for CITA/CITA National fellows across Canada 2022-present

- Globular Clusters and Their Tidal Tails–From the Milky Way to the Local Group: Week-long conference Toronto 2024
- CIERA Pulsar Workshop: A three-day workshop of pulsar physics and dynamics in globular clusters Northwestern 2019

### Peer Reviewer

The Astrophysical Journal, the Astrophysical Journal Letters, the Monthly Notices of the Royal Astronomical Society, Nature, Nature Astronomy, and the Open Journal of Astrophysics

## Outreach/Departmental Service

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### DEPARTMENTAL SERVICE

#### Northwestern Physics and Astronomy Graduate Student Council 2021-2022

Master's Student Committee Chair · Supported Master's students by ensuring awareness of policies, deadlines, and other information pertinent to Master's students success both at Northwestern and in the future, and provided the department with authentic feedback as the Master's program develops from its infancy

#### CIERA K-12 Task Force Northwestern 2021-2022

Committee · Developed a framework for creating and sustaining K-12 outreach initiatives at CIERA with the goal of ensuring that CIERA K-12 outreach has a social justice impact

### OUTREACH

#### CIERA Astronomer Evening 2018-2022

Monthly conversations with the public in Dearborn Observatory including open Q & A sessions and interactive activities

#### Astronomy on Tap Chicago 2017-2022

Engaged the public at local venues with professional astronomy talks, trivia, and prizes once per quarter as part of a national outreach effort

#### Letters to a Pre-Scientist 2018-2019

Exchanged letters with middle school students in high-poverty areas to demystify STEM career and inspire future scientists

#### Northwestern Seven Minutes of Science 2017

TED-style public symposium on [Pulsars in the Snow Globes](#)

#### Helix Magazine 2017

Outreach article on the story of two camps of astronomers behind the discovery of the first binary black hole merger: [Astronomy Fugato: Two Approaches, One Vast Field of Discovery](#)

## Presentations

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29 total presentations. \* marks invited talks

### CONFERENCES

1. Globular Clusters and Their Tidal Tails Conference, Toronto, Canada May 2024
2. AAS Division of Dynamical Astronomy Meeting, Toronto, Canada May 2024
3. Intermediate-mass Black Holes Meeting II, San Pedro, Belize December 2023
4. MODEST-23, Evanston, IL August 2023
5. Intermediate-mass Black Holes Meeting I, San Juan, PR May 2022
6. AAS HEAD Meeting (stellar/compact object session), Pittsburgh, PA March 2022
7. Dynamical Formation of Gravitational Wave Sources, Aspen, CO January 2022
8. \* 16th Marcel Grossmann Meeting July 2021
9. EAS Annual Meeting (session 'Where are the BH-NS binaries') June 2021
10. IAU Symposium 351 & MODEST-19, Bologna, Italy May 2019
11. Midwest Relativity Meeting, Milwaukee, WI October 2018
12. MODEST-18, Santorini, Greece June 2018

## SEMINARS AND COLLOQUIUMS

1. UC Berkeley Explosive Astro Seminar November 2024
2. \* UCLA TEPAPP Seminar November 2024
3. Carnegie Mellon University Multi-messenger Astronomy Seminar October 2024
4. \* Perimeter Institute Strong Gravity Seminar November 2023
5. \* McMaster University Astro Group Talk May 2023
6. \* McGill Space Institute Seminar February 2023
7. UC-Santa Cruz FLASH Seminar December 2021
8. Carnegie Observatories Lunch Talk November 2021
9. UCLA Lunch Talk November 2021
10. Caltech TAPIR Seminar November 2021
11. Princeton University Galread Seminar October 2021
12. Columbia University Astro Seminar October 2021
13. Carnegie Mellon University & University of Pittsburgh Astro Lunch Seminar October 2021
14. National Radio Astronomy Observatory TUNA Lunch Talk May 2021
15. Texas Tech University Summer Astro Seminar May 2021
16. CCA Stars & Compact Objects Meeting May 2021
17. Northwestern University Brown Bag Seminar April 2019

## Teaching Experience

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**Northwestern University** 2016-2017 & Fall 2020

Teaching assistant · Taught weekly discussions or lab sessions for four different undergraduate General/College Physics courses · Taught a graduate course on Methods of Theoretical Physics

**CIERA High School Summer Camp** 2019

Co-organizer · Co-organized the high school summer camp with team-style learning, hands-on training, real astronomy research experiences and introductory lectures

Lecturer · Taught multiple lectures ranging from astronomy to computer programming

**Niles North High School** 2018-2019

Teaching assistant in astronomy classes · GK-12 Program

## Student Mentoring

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**Aryamann Rao (one paper submitted)** University of Toronto 2023-present

Undergraduate project: Predicting the rate of fast radio bursts in globular clusters from binary black hole observations

**Aryanna Schiebelbein-Zwack (one paper in preparation)** CITA 2024 summer-present

PhD project: Estimating the number and properties of detached neutron star-main-sequence star binaries from disrupted globular clusters detectable by Gaia

**Angela Borchers (one paper in preparation)** Max Planck Institute 2024 winter-present

PhD project: Exploring the spins and recoil kicks of hierarchical binary black hole mergers

**Dang Pham** University of Toronto 2023-2024

University of Toronto postdoc-graduate student mentorship program

**Steffani Grondin** University of Toronto 2022-2023

University of Toronto postdoc-graduate student mentorship program

**Rachel Zhang** Northwestern 2022-2024

PhD project: Studying the effects of dynamics on idealized binary populations

## Workshops & Skills

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- Python

- **Dynamical Formation of Transients in Galactic Nuclei (competitive)**

Two-week working group at the Aspen Center for Physics

Aspen 2024

- **4th POSYDON Collaboration Meeting (invitation-only)**

One-week meeting of collaborative hacking and strategic discussions on the next-generation binary population synthesis code POSYDON

Geneva 2024

- **Stellar Interactions and the Transients They Cause (competitive)**

Three-week workshop at the Aspen Center for Physics

Aspen 2023

- **Black Hole Dynamics in Clusters**

One-week workshop on black hole dynamics

Northwestern 2018

- **Heidelberg Summer School**

One-week summer school on compact objects & gravitational waves

University of Heidelberg 2017

- **MESA Summer School**

One-week summer school on the stellar evolution code MESA

UC Santa Barbara 2017

- **Research Communication Training Program**

Ten-week courses on science communication and presentation skills, culminated in a TED-style presentation

Northwestern 2017