Claire Shi Ye

Postdoctoral Fellow, Canadian Institute for Theoretical Astrophysics (CITA),
60 St. George Street, 1305, Toronto, ON M5S 3H8
email: claireshiye@cita.utoronto.ca website: Personal Website, CITA

Education

Northwestern University, USA August 2022
Ph.D. Astronomy, Advisor: Frederic A. Rasio

Northwestern University, USA 2016
M.Sc. Physics, Advisor: Melville P. Ulmer

Zhejiang University, China 2015
B.Sc. Physics · GPA: 3.82

Honors & Awards

CITA Postdoctoral Fellowship 2022-present

Jeffrey L. Bishop Fellowship 2023-2025
Bi-annually awarded to CITA postdoc for outstanding research work: $3k

IOP Publishing Top Cited Paper Award 2023
For the article 'On the Rate of Neutron Star Binary Mergers from Globular Clusters', Ye, C. S., et al. 2020, ApJL, 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.

IOP Publishing Top Cited Paper Award 2023
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, ApJS, 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.

NSF GK-12 'Reach for the Stars' Fellowship 2018-2019
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

Publications

42 total publications (ADS Library), including 9 first-author and 7 second-author (h-index=23).

FIRST- AND SECOND-AUTHOR PAPERS

16. **Mass Distribution of Binary Black Hole Mergers from Young and Old Dense Star Clusters**
Ye, C. S., Fishbach, M., Kremer, K., & Reina-Campos, M. 2025, arXiv:2507.07183

15. **Gravitational-wave kicks impact spins of black holes from hierarchical mergers**
Borchers, A. (graduate student), **Ye, C. S.**, & Fishbach, M. 2025, arXiv:2503.21278 (Accepted for publication at ApJ)

14. **Predicting the rate of fast radio bursts in globular clusters from binary black hole observations**
Rao, A. (undergraduate student), **Ye, C. S.**, & Fishbach, M. 2025, ApJL, 979, L12

13. **Can slow pulsars in Milky Way globular clusters form via partial recycling?**
Kremer, K., **Ye, C. S.**, Heinke, C. O. et al. 2024, ApJL, 977, L42

12. **Lower-mass-gap Black Holes in Dense Star Clusters**
Ye, C. S., Kremer, K., Ransom, S. et al. 2024, ApJ, 975, 77

11. **The Redshift Evolution of the Binary Black Hole Mass Distribution from Dense Star Clusters**
Ye, C. S. & Fishbach, M. 2024, ApJ, 967, 62

10. **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

9. **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.**, Kıroğlu, 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** (181 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** (141 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** (82 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** (73 citations)
Kremer, K., **Ye, C. S.**, Chatterjee, S., et al. 2018, ApJL, 855, L15-21

REFEREED CO-AUTHOR PAPERS

20. **The ejection and detectability of high- and hyper-velocity stars by compact object binaries in globular clusters**
Evans, F. A., Grondin, S. M., **Ye, C. S.**, Webb, J., Laroche, A., Bovy, J. 2025, arXiv:2506.14273

19. **Binary properties of the globular cluster 47 Tuc (NGC 104). A dearth of short-period binaries**
Müller-Horn, J., et al. (including **Ye, C. S.**) 2025, A&A, 693, A161

18. **Investigating cannibalistic millisecond pulsar binaries using MESA: new constraints from pulsar spin and mass evolution**
Misra, D., Linares, M., **Ye, C. S.** 2025, A&A, 693, A314

17. **Gravitational Microlensing Rates in Milky Way Globular Clusters**
Kıroğlu, 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

Presentations

38 total and 12 invited presentations. * marks invited talks

CONFERENCES

1.	* IAU Symposium 398 & MODEST-25, Seoul, Korea	June 2025
2.	* EAS Annual Meeting (special session 'Compact Binary Pulsars')	June 2025
3.	* 55th AAS Division of Dynamical Astronomy Meeting, Atlanta, GA	May 2025
4.	Globular Clusters and Their Tidal Tails Conference, Toronto, Canada	May 2024
5.	54th AAS Division of Dynamical Astronomy Meeting, Toronto, Canada	May 2024
6.	Intermediate-mass Black Holes Meeting II, San Pedro, Belize	December 2023
7.	MODEST-23, Evanston, IL	August 2023
8.	Intermediate-mass Black Holes Meeting I, San Juan, PR	May 2022
9.	AAS HEAD Meeting (stellar/compact object session), Pittsburgh, PA	March 2022
10.	Dynamical Formation of Gravitational Wave Sources, Aspen, CO	January 2022
11.	* 16th Marcel Grossmann Meeting	July 2021
12.	EAS Annual Meeting (session 'Where are the BH-NS binaries')	June 2021
13.	IAU Symposium 351 & MODEST-19, Bologna, Italy	May 2019
14.	Midwest Relativity Meeting, Milwauke, WI	October 2018
15.	MODEST-18, Santorini, Greece	June 2018

SEMINARS AND COLLOQUIUMS

1.	* CCA Star & Plasma Astrophysics Meeting	May 2025
2.	* Caltech TAPIR Seminar	April 2025
3.	* UC San Diego Simulation and Theory Meeting	March 2025
4.	* Saint Mary's University Astronomy Colloquium	March 2025
5.	Columbia University THEA Seminar	November 2024
6.	Princeton University Thunch Talk	November 2024
7.	UC Berkeley Explosive Astro Seminar	November 2024
8.	* UCLA TEPAPP Seminar	November 2024
9.	Carnegie Mellon University Multi-messenger Astronomy Seminar	October 2024
10.	* Perimeter Institute Strong Gravity Seminar	November 2023
11.	* McMaster University Astro Group Talk	May 2023
12.	* McGill Space Institute Seminar	February 2023
13.	UC-Santa Cruz FLASH Seminar	December 2021
14.	Carnegie Observatories Lunch Talk	November 2021

15. UCLA Lunch Talk November 2021
16. Caltech TAPIR Seminar November 2021
17. Princeton University Galread Seminar October 2021
18. Columbia University Astro Seminar October 2021
19. Carnegie Mellon University & University of Pittsburgh Astro Lunch Seminar October 2021
20. National Radio Astronomy Observatory TUNA Lunch Talk May 2021
21. Texas Tech University Summer Astro Seminar May 2021
22. CCA Stars & Compact Objects Meeting May 2021
23. Northwestern University Brown Bag Seminar April 2019

Leadership & Professional Service

Cluster Monte Carlo Collaboration
Lead the development of physics related to the formation and evolution of compact objects for the state-of-the-art Cluster Monte Carlo *N*-body dynamics code, with a focus on neutron stars and low-mass black holes

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

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

Teaching Experience

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

Aryamann Rao (one publication) University of Toronto 2023-2025
Undergraduate project: Predicting the rate of fast radio bursts in globular clusters from binary black hole observations

Angela Borchers (one paper accepted) Max Planck Institute 2024-present
PhD project: Gravitational-wave kicks impact spins of black holes from hierarchical mergers

Aryanna Schiebelbein-Zwack (one paper in preparation) CITA 2024-present
PhD project: Estimating the number and properties of astrometric compact object–main-sequence star binaries from disrupted globular clusters detectable by Gaia

Mark Dodici (one paper in preparation) University of Toronto 2024-present
PhD project: Modeling Intermediate-mass black holes in dense star clusters

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 University 2022-2024
PhD project: Studying the effects of dynamics on idealized binary populations

Workshops

Dynamical Formation of Multi–band Transients in Galactic Nuclei Santa Barbara 2025
One-week KITP program

Dynamical Formation of Transients in Galactic Nuclei (competitive) Aspen 2024
Two-week working group at the Aspen Center for Physics

4th POSYDON Collaboration Meeting (invitation-only) Geneva 2024
One-week meeting of collaborative hacking and strategic discussions on the next-generation binary population synthesis code POSYDON

Stellar Interactions and the Transients They Cause (competitive) Aspen 2023
Three-week workshop at the Aspen Center for Physics

Black Hole Dynamics in Clusters Northwestern 2018
One-week workshop on black hole dynamics

Heidelberg Summer School University of Heidelberg 2017
One-week summer school on compact objects & gravitational waves

MESA Summer School UC Santa Barbara 2017
One-week summer school on the stellar evolution code MESA

Research Communication Training Program Northwestern 2017
Ten-week courses on science communication and presentation skills, culminated in a TED-style presentation