

CURRICULUM VITAE

Zeyuan Xuan

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CONTACT INFORMATION	CIERA, Northwestern University Room 7401, 1800 Sherman Ave Evanston, IL 60201	<i>E-mail:</i> zeyuan.xuan@northwestern.edu <i>Web:</i> https://zeyuanxuan.github.io
APPOINTMENTS	Northwestern University , Evanston, Illinois, United States CIERA Fellow, Center for Interdisciplinary Exploration and Research in Astrophysics, 2026–Present	
RESEARCH INTERESTS	Compact object dynamics in astrophysical environments, such as globular clusters, galactic nuclei, AGN disks, and hierarchical triple systems. Gravitational wave data analysis, including waveform modeling and parameter estimation for environmentally perturbed systems, eccentric binaries, and extreme mass ratio inspirals. Multi-body dynamics, multi-band and multi-messenger astrophysics and their cosmological applications.	
EDUCATION	University of California, Los Angeles , Los Angeles, California, United States Ph.D. in Physics, June 2026, Advisor: Smadar Naoz M.S. in Physics, December 2022 Peking University , Beijing, China B.S. in Physics, June 2021, Advisor: Xian Chen	
SCHOLARSHIPS HONORS AND AWARDS	Dissertation Year Award , UCLA, 06/2025 Mani L. Bhaumik Graduate Fellowship in Theoretical Physics , 06/2025 Raynor L. Duncombe Student Research Prize , American Astronomical Society Division on Dynamical Astronomy, 05/2025 Mani L. Bhaumik Graduate Fellowship in Theoretical Physics , 06/2024 Mani L. Bhaumik Graduate Fellowship in Theoretical Physics , 06/2023 Mani L. Bhaumik Graduate Fellowship in Theoretical Physics , 06/2022 Cross-disciplinary Scholars in Science and Technology , UCLA, 03/2020 Scholarship of Peking University , 10/2019 National Scholarship 12/2018	
TEACHING	Graduate Teaching Fellow , UCLA, 09/2024–06/2026 Graduate Teaching Associate , UCLA, 12/2022–09/2024 (5 quarters) Graduate Teaching Assistant , UCLA, 09/2021–12/2022 (4 quarters) Courses: ASTR 280: Fluid Dynamics in Astrophysics Physics 105B: Analytic Mechanics Physics 5A: Mechanics and Energy Physics 5C: Electricity, Magnetism, and Modern Physics	
ACADEMIC SERVICE	Referee for <i>Physical Review Letters</i> , <i>Physical Review D</i> , <i>The Astrophysical Journal</i> , <i>Astronomy & Astrophysics</i>	
CONFERENCES AND TALKS	Invited Talk , “From Bursts to Binary Dynamics: Unlocking the Astrophysics of Eccentric Gravitational Wave Sources,” ITC Luncheon Talk, Harvard University, Cambridge, MA, 09/2025 MATs Seminar, Massachusetts Institute of Technology, Cambridge, MA, 09/2025	

GW Focus Meeting, Canadian Institute for Theoretical Astrophysics, Toronto, Canada, 09/2025
 Astro Coffee, Institute for Advanced Study, Princeton, NJ, 10/2025
 THEA Seminar, Columbia University, New York, NY, 10/2025
 Theory Group Meeting, CIERA, Northwestern University, Evanston, IL, 11/2025
 TAPIR Seminar, California Institute of Technology, Pasadena, CA, 11/2025
 KICP Seminar, The University of Chicago, Chicago, IL, 12/2025

Invited Talk, “Highly Eccentric Binaries: Population and Detectability in the LISA Band,” MIAPbP Enabling Future Gravitational Wave Astrophysics in the milli-Hertz Regime Workshop, Garching, Germany, 07/2025

Duncombe Award Talk, “Probing Dynamically Formed Binary Black Holes in Milky Way Globular Clusters,” 2025 DDA Annual Meeting, Atlanta, 05/2025

Invited Talk, “Probing Highly Eccentric Compact Binaries with mHz Gravitational Waves,” Oxford Astrophysics Seminar Series, UK, 05/2025

Contributed Talk, “Gaps and Glitches: Extracting Eccentric Signals in Realistic LISA Data,” LISA Sprint 2025 Workshop, Huntsville, 04/2025

Contributed Talk, “Highly Eccentric Binaries: Detectability, Population and Astrophysical Inference in mHz Gravitational Wave Band,” Frontiers of Astrophysical Black Holes Conference, Sexten, Italy, 03/2025

Invited Talk, “Highly Eccentric Binaries in mHz Gravitational Wave Band,” Caltech Gravitational Wave Seminar Series, 10/2024

Poster, “Detecting ‘Bursting’ Stellar-Mass Binary Black Holes with LISA,” 15th LISA Symposium, Dublin, 07/2024

Contributed Talk, “Dynamical Formation of Highly Eccentric Compact Object Binaries and Their GW Signatures in the mHz Band,” 2024 DDA Annual Meeting, Toronto, 05/2024

Contributed Talk, “Search for Repeated Burst Gravitational Wave Signals,” LISA Sprint 2024 Workshop, Caltech, 04/2024

Invited Talk, “Eccentric Sources and Their Gravitational Wave Signal in the Millihertz Band,” KIAA-DoA Seminar, Peking University, 08/2023

Poster, “Detecting Accelerating Eccentric Binaries in the LISA Band,” eXtreme Black Holes Conference, Aspen, 03/2023

PUBLICATIONS

11. **Zeyuan Xuan**, Smadar Naoz, Kyle Kremer, Michael L. Katz, Bence Kocsis, and Erez Michaely. Eccentric Stellar-mass Binary Black Holes: Population, Detectability, and Waveform Analysis in the LISA and LIGO Era. *arXiv:2605.15265* (2026)
10. **Zeyuan Xuan**, Cheyanne Shariat, Smadar Naoz. From Wide Triples to UCXBs: Multimessenger Signatures of Dynamically-formed Black Hole-White Dwarf Systems with LISA. *The Astrophysical Journal*, 995, 27 (2025)
9. Charlie Sharpe, Yonadav Barry Ginat, **Zeyuan Xuan**, and Bence Kocsis. Resonant Locking Between Binary Systems Induced by Gravitational Waves. *arXiv:2502.01733 [gr-qc]* (2025)
8. **Zeyuan Xuan**, Kyle Kremer, and Smadar Naoz. Localizing Dynamically-Formed Black Hole Binaries in Milky Way Globular Clusters with LISA. *The Astrophysical Journal Letters*, 985, L42 (2025)
7. **Zeyuan Xuan**, Smadar Naoz, Alvin K. Y. Li, Bence Kocsis, Erik Petigura, Alan M. Kneee, Jess McIver, Kyle Kremer, Will M. Farr. Extracting Astrophysical Information of Highly-Eccentric Binaries in the Millihertz Gravitational Wave Band. *Physical Review D*, 111, 043018 (2025)
6. **Zeyuan Xuan**, Smadar Naoz, Bence Kocsis, and Erez Michaely. Stochastic Gravitational Wave Background from Highly-Eccentric Stellar-Mass Binaries in the Milli-hertz Band. *Physical Review*

D, 110, 023020 (2024)

5. **Zeyuan Xuan**, Smadar Naoz, Bence Kocsis, and Erez Michaely. Detecting Gravitational Wave Bursts From Stellar-Mass Binaries in the Milli-hertz Band. *The Astrophysical Journal*, 965, 148 (2024)

4. **Zeyuan Xuan**, Smadar Naoz, and Xian Chen. Detecting Accelerating Eccentric Binaries in the LISA Band. *Physical Review D*, 107, 043009 (2023)

3. **Zeyuan Xuan**, Peng Peng, and Xian Chen. Degeneracy between Mass and Peculiar Acceleration for the Double White Dwarfs in the LISA Band. *Monthly Notices of the Royal Astronomical Society*, 502(3), 4199–4209 (2021)

2. Alejandro Torres-Orjuela, Pau Amaro-Seoane, **Zeyuan Xuan**, Alvin J. K. Chua, Mara J. B. Rosell, and Xian Chen. Exciting Modes Due to the Aberration of Gravitational Waves: Measurability for Extreme-Mass-Ratio Inspirals. *Physical Review Letters*, 127(4), 041102 (2021)

1. Xian Chen, **Zeyuan Xuan**, and Peng Peng. Fake Massive Black Holes in the Milli-Hertz Gravitational-wave Band. *The Astrophysical Journal*, 896, 171 (2020)