

# Yuexin ZHANG

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## Employment

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**Center for Astrophysics, Harvard & Smithsonian, US** Nov 2023–present  
NWO Rubicon Fellow

**Kapteyn Astro. Institute, University of Groningen, NL** Oct 2023–present  
NWO Rubicon Fellow

## Education

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**Kapteyn Astro. Institute, University of Groningen, NL** Oct 2019–Sep 2023  
PhD in Astronomy. Advisor: Mariano Méndez and Diego Altamirano

**Department of Physics, Fudan University, CN** Sep 2015–June 2019  
B.S. (*Honor*) in Physics. Advisor: Cosimo Bambi

**Hamburg University, DE** Jul 2018  
Summer Exchange Student

## Previous Academic Positions

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**University of Southampton, UK** Feb 2023  
Visiting Researcher. PI: Diego Altamirano

**Institute of High-Energy Physics, CAS, CN** Mar 2021–Mar 2022  
Visiting Researcher. PI: Shuang-Nan Zhang and Jin-Lu Qu

**Shanghai Astronomical Observatory, CAS, CN** Jun 2019–Sep 2019  
Summer Visiting Student. PI: Wenfei Yu

## Honors and Awards

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NWO Rubicon Fellowship ( $\sim 150\text{k EUR}$ ) 2023–2025  
*“New light on the origin of X-ray variability in Galactic accreting black holes”*

CSC and UoG Scholarship ( $\sim 100\text{k EUR}$ ) 2019–2023  
*“Spectral variability of compact X-ray sources”*

Shanghai Outstanding Graduate 2019

Wangdao Scholar (named after the former president of Fudan) 2019

Fudan’s Undergraduate Research Opportunities Program (10k CNY) 2018–2019  
*“Testing general relativity using X-ray reflection spectroscopy”*

## Member

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NICER Science Team 2023–present

Insight-HXMT Science Team 2021–2022

## Professional Service

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Panelist for NASA proposals

2024

## Observation

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- [1] Co-I, *IXPE* Cycle 1, “*Evolving slim-disk polarization with LMC X-3*”, PI: Steiner, 1.2 ms
- [2] PI, *Insight-HXMT* AO-6, “*Unravelling the origin of fast time variability in X-ray binaries with Insight-HXMT*”, 3.6 ms
- [3] PI, *Insight-HXMT* AO-5, “*On the QPO properties of a black-hole X-ray binary*”, 10 ks

## Publications

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- [1] Jin, P., Zhang, G., **Zhang, Y.** et al. (2024). *The bright black hole X-ray binary 4U 1543–47 during 2021 outburst - I. A clear state transition from super-Eddington to sub-Eddington accretion revealed by Insight-HXMT*. Submitted to MNRAS.
- [2] Zhao, S., Tao, L., Li, P., **incl. Zhang, Y.** et al. (2024). *The bright black hole X-ray binary 4U 1543–47 during 2021 outburst: a thick accretion disk inflated by high luminosity*. Accepted by A&A.
- [3] **Zhang, Y.**, Méndez, M., Motta, S. et al. (2024). *A systematic study of the high-frequency bump in the black-hole low-mass X-ray binary GX 339–4*. Monthly Notices of the Royal Astronomical Society, 527(3), 5638–5648
- [4] Zhang, L., Méndez, M., García, F. et al., **incl. Zhang, Y.** (2023). *Type-A quasi-periodic oscillation in the black hole transient MAXI J1348–630*. Monthly Notices of the Royal Astronomical Society, 526(3), 3944–3950
- [5] Ma, R., Méndez, M., García, F. et al., **incl. Zhang, Y.** (2023). *Variable corona during the transition from type-C to type-B quasi-periodic oscillations in the black hole X-ray binary MAXI J1820+070*. Monthly Notices of the Royal Astronomical Society, 525(1), 854–875
- [6] Yang, Z. X., Zhang, L., Zhang S. N., **incl. Zhang, Y.** (2023). *Fast transitions of X-ray variability in the black hole transient GX 339–4: comparison with MAXI J1820+070 and MAXI J1348–630*. Monthly Notices of the Royal Astronomical Society, 521(3), 3570–3584
- [7] **Zhang, Y.**, Méndez, M., García, F. et al. (2023). *A NICER look at the jet-like corona of MAXI J1535–571 through type-B quasi-periodic oscillation*. Monthly Notices of the Royal Astronomical Society, 520(4), 5144–5156
- [8] **Zhang, Y.**, Méndez, M., García, F. et al. (2022). *The evolution of the high-frequency variability in the black hole candidate GRS 1915+105 as seen by RXTE*. Monthly Notices of the Royal Astronomical Society, 514(2), 2891–2901
- [9] García, F., Karpouzas, K., Méndez, M. et al., **incl. Zhang, Y.** (2022). *The evolving properties of the corona of GRS 1915+105: a spectral-timing perspective through variable-Comptonization modelling*. Monthly Notices of the Royal Astronomical Society, 513(3), 4196–4207.
- [10] Liu, H., Fu, Y., Bambi, C. et al., **incl. Zhang, Y.** (2022). *The disk wind in GRS 1915+105 as seen by Insight-HXMT*. The Astrophysical Journal, 933(2), 122.
- [11] Yang, Z. X., Liang, Z., Bu, Q. C. et al., **incl. Zhang, Y.** (2022). *The accretion flow geometry of MAXI J1820+070 through broadband noise research with Insight-HXMT*.

- The Astrophysical Journal, 932(1), 7.
- [12] **Zhang, Y.**, Méndez, M., García, F. et al. (2022). *The evolution of the corona in MAXI J1535-571 through type-C quasi-periodic oscillations with Insight-HXMT*. Monthly Notices of the Royal Astronomical Society, 512(2), 2686-2696.
  - [13] Méndez, M., Karpouzas, K., García, F. et al., **incl. Zhang, Y.** (2022). *Coupling between the accreting corona and the relativistic jet in the microquasar GRS 1915+105*. Nature Astronomy, 6(5), 577-583.
  - [14] Karpouzas, K., Méndez, M., García, F. et al., **incl. Zhang, Y.** (2021). *A variable corona for GRS 1915+105*. Monthly Notices of the Royal Astronomical Society, 503(4), 5522-5533.
  - [15] Tripathi, A., **Zhang, Y.**, Abdikamalov, A. B. et al. (2021). *Testing general relativity with NuSTAR data of galactic black holes*. The Astrophysical Journal, 913(2), 79.
  - [16] Abdikamalov, A. B., Ayzenberg, D., Bambi, C. et al. **incl. Zhang, Y.** (2021). *Implementation of a radial disk ionization profile in the relxill\_nk model*. Physical Review D, 103(10), 103023.
  - [17] Liu, H., Ji, L., Bambi, C. et al., **incl. Zhang, Y.** (2021). *Testing evolution of LFQPOs with mass accretion rate in GRS 1915+105 with Insight-HXMT*. The Astrophysical Journal, 909(1), 63.
  - [18] **Zhang, Y.**, Abdikamalov, A. B., Ayzenberg, D. et al. (2019). *Tests of the Kerr hypothesis with GRS 1915+105 using different RELXILL flavors*. The Astrophysical Journal, 884(2), 147.
  - [19] **Zhang, Y.**, Abdikamalov, A., Ayzenberg, D. et al. (2019). *About the Kerr nature of the stellar-mass black hole in GRS 1915+105*. The Astrophysical Journal, 875 (1), 41.
  - [20] **Zhang, Y.**, Zhou, M., & Bambi, C. (2018). *Iron line spectroscopy of black holes in asymptotically safe gravity*. The European Physical Journal C, 78 (5), 376.

## Conferences and Talks

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- [1] Seminar, Wuhan, CN 8 Oct 2023  
“The accretion-ejection coupling in Galactic accreting black holes”
- [2] Seminar, Amsterdam, NL 13 Sep 2023  
“The accretion-ejection coupling in Galactic accreting black holes”
- [3] Seminar, Kunming, CN 14 Aug 2023  
“The accretion-ejection coupling in Galactic accreting black holes”
- [4] Seminar, Shanghai, CN 1 Aug 2023  
“The accretion-ejection coupling in Galactic accreting black holes”
- [5] Seminar, Beijing, CN 27 Jul 2023  
“The accretion-ejection coupling in Galactic accreting black holes”
- [6] The First Vasto Accretion Meeting, Vasto, IT 19–23 Jun 2023  
“The corona-jet evolution of black-hole X-ray transients MAXI J1535–571 and MAXI J1820+070 (Poster)”
- [7] 10th Microquasar Workshop, Crete, GR 22–26 May 2023  
“The jet-like corona of black-hole X-ray transient from the HIMS to the SIMS”
- [8] Nederlandse Astronomen Conferentie 2023, Leeuwarden, NL 15–17 May 2023  
“Corona as the energy reservoir for radio jet: a case study of GRS 1915+105 (Poster)”
- [9] NOVA Network NW3, Amsterdam, NL 19 Jan 2023

- “The jet-like corona of black-hole X-ray transients from the HIMS to the SIMS”*
- [10] 44th COSPAR Scientific Assembly, Athens, GR 16–24 Jul 2022  
*“Corona evolution of MAXI J1535–571 revealed by type-C quasi-periodic oscillations observed with Insight-HXMT”*  
*“The evolution of the high-frequency variability in GRS 1915+105 as seen by RXTE (Poster)”*
- [11] Black Hole Accretion under the X-ray Microscope, Madrid, ES 14–17 Jun 2022  
*“The evolution of the corona in MAXI J1535–571 through type-C quasi-periodic oscillations with Insight-HXMT (Poster)”*
- [12] China Astronomy Annual Meeting (online), Nanchong, CN 2–6 Dec 2021  
*“Mapping the Comptonization region of black holes up to 100 keV through quasi-periodic oscillations in the intermediate state with Insight-HXMT”*
- [13] The future of X-ray timing, Amsterdam, NL 21–25 Oct 2019
- [14] Recent progress in relativistic astrophysics, Shanghai, CN 6–8 May 2019

## References

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Prof. Mariano Méndez: mariano@astro.rug.nl  
 Dr. James (“Jack”) Steiner: james.steiner@cfa.harvard.edu  
 Prof. Diego Altamirano: d.altamirano@soton.ac.uk  
 Prof. Shuang-Nan Zhang: zhangsn@ihep.ac.cn  
 Prof. Cosimo Bambi: bambi@fudan.edu.cn