

Kwangmin Oh

Department of Physics & Astronomy, Michigan State University, MI, USA
Email: min8582046@gmail.com

Summary

Compact objects/binaries in dense stellar systems. X-ray spectral-timing studies of globular cluster ULXs/CVs/MSPs/LMXBs. Monte-Carlo cluster simulation to the observation. LVK contributions. Machine learning techniques on astronomical data.

Appointments

Postdoctoral Research Associate Michigan State University, East Lansing, MI	2023–present
---	--------------

Education

Ph.D., Astronomy & Astrophysics Chungnam National University, Daejeon, Korea	2023
B.S., Astronomy & Space Science Chungnam National University, Daejeon, Korea	2017

Research

Compact Objects in Clusters Michigan State University, Stephen E. Zepf: Multi-epoch X-ray spectral-timing of GC ULXs/BH candidates.	2023–present
Cluster Dynamics & Binary Evolution Chungnam National University, David Hui: Monte-Carlo cluster modeling with observed CV populations in dense clusters.	2021–present
Gravitational-Wave Data Analysis LIGO/Virgo/KAGRA: Autoregressive denoising; noise analyses; remote shifts for alert handling/reporting.	2020–2024

Teaching & Mentoring

Undergraduate Mentorship Michigan State University, Bernard Leal, Sushit Tanay: X-ray source multiwavelength classification; Published in MNRAS.	2024–present
Teaching Assistant Chungnam National University: Introductory Astronomy for Non-Majors, Astronomical Instruments, Astronomical Observation & Practic	2017–2023
Research Assistant Statistics Department of Chungnam National University	2017

Observing & Technical Skills

Programming: Python, R, Bash; Linux scientific scripting; CIAO, HEASoft; IDL; IRAF

Data Analysis: X-ray spectroscopy/imaging/timing (Chandra, XMM); optical/UV spectroscopy (SOAR, Gemini, Magellan); Fermi LAT γ -ray likelihood

Simulation: Monte Carlo cluster simulation; CLOUDY photoionization

Machine Learning: Autoregressive modeling; supervised/ensemble classification

Collaborations

Contributing Author, *AXIS Probe Mission Concept* white paper (2025)

Member, LIGO–Virgo–KAGRA Collaboration (2019–2024; remote shifts; noise analyses)

Participant, Rubin Observatory Star Cluster Science Collaboration (2024–present)

Fellowships & Awards

Research Subsidies for Ph.D. Fellowship, NRF Korea (2022–2023; \$40K)

Global Ph.D. Fellowship, NRF Korea (2019–2022; \$100K)

Excellence & Research Fair Awards, CNU (2021–2022)

BK21 Plus Graduate Fellowship, CNU (2019; \$7K)

Merit/Research Assistant Scholarships, CNU (2017–2021)

Talks & Presentations

[Talk]

2025 Sep Compact Objects in Michigan and Ontario (University of Michigan–Flint, USA): *A young ultra-compact X-ray binary in NGC 1399*

2024 Aug MODEST-24 (Nicolaus Copernicus Astronomical Center, Warsaw, Poland): *Probing intracluster dynamics and evolution of globular clusters through cataclysmic variable populations*

2024 Jul COSPAR 2024 (Korea): *Probing intracluster dynamics and evolution of globular clusters through cataclysmic variable populations*

2024 May Globular Clusters and Their Tidal Tails (University of Toronto, Canada): *Intracluster dynamics and evolution via CV populations*

2024 May Compact Objects in Michigan and Ontario (Henry Ford College, MI, USA): *Ultraluminous X-ray source in the globular cluster NGC 1399*

2022 Oct Invited — 67th Gravitational Waves & Numerical Relativity (APCTP, Korea): *Unveiling impacts of dynamical effects on compact binaries in globular clusters*

2021 Oct 5th Center for High-Energy Astrophysics Workshop (Korea): *Classifying X-ray sources in globular clusters by ensemble learning*

2020 Nov 7th SGPF Conference (National Research Foundation of Korea, Korea): *Adopting machine-learning techniques for X-ray source classification in globular clusters*

2020 Jan 4th Center for High-Energy Astrophysics Workshop (Korea): *Adopting machine learning for identifying X-ray sources in globular clusters*

2019 Jan 3rd Center for High-Energy Astrophysics Workshop (Korea): *X-ray observations*

of globular clusters

2018 Apr CHEA Workshop on High-Energy Astrophysics of Compact Objects (UNIST, Korea): *X-ray emission from globular clusters*

2018 Jan 2nd Center for High-Energy Astrophysics Workshop (Korea): *High-energy observations of globular clusters*

2017 Dec 7th Fermi Asian Network Workshop (Lijiang, China): *High-energy observations of globular clusters*

[Posters]

2025 Jun IAU Symposium 398 & MODEST-25 (Seoul National University, Korea): *Dynamical status of globular clusters and its influences on binary populations*

2024 Jan AAS 243 (New Orleans, USA): *Influences of dynamical disruptions on the evolution of pulsars in globular clusters*

2019 Sep X-ray Astronomy 2019 — Current Challenges and New Frontiers (CNR/INAF, Bologna, Italy): *Multi-epoch X-ray observations of the globular cluster M62*

2019 Aug KAGRA 23rd Face-to-Face Meeting (University of Toyama, Japan): *Searching continuous gravitational waves with an autoregressive approach*

2019 Apr KAGRA 22nd Face-to-Face Meeting (RESCEU, University of Tokyo, Japan): *Searching for gravitational waves from core-collapse supernovae using weighted wavelet Z-transform and Hilbert–Huang transform*

2018 Jun MODEST-18: Dense Stellar Systems in the Era of GAIA, LIGO & LISA (Santorini, Greece): *Multi-epoch X-ray observations of the globular cluster M62*

2017 Oct 7th International Fermi Symposium (Congress Center Garmisch-Partenkirchen, Germany): *Re-examining the gamma-ray properties of globular clusters*

[Seminars]

2025 Jun Chungnam National University (Daejeon, Korea): *Influence of dynamics and evolution of X-ray sources in globular clusters*

2024 Oct Michigan State University (East Lansing, USA): *Dynamical effects in globular clusters and the formation of X-ray sources*

2023 Jul The University of Hong Kong (Hong Kong): *Unveiling interactions in globular clusters and their impact on compact-binary evolution*

Peer-Reviewed Publications

1. Dage, K. C. et al., including **Kwangmin, Oh**

Classifying compact radio emission in nearby galaxies: A 10 GHz study of AGN, supernovae, anomalous microwave emission, and star-forming regions, 2025, *ApJ*, 170, 201

2. Leal, B., **Kwangmin, Oh**, Strader, J., Zepf, S. E., Dage, K., Kim, S., Hui, C. Y.
The X-ray source population of the metal-rich globular cluster NGC 6528, 2025, *MNRAS*, in press, doi:10.1093/mnras/staf1349

3. Dage, K. C., Panurach, T., **Kwangmin, Oh**, Sudha, M., Armas Padilla, M., Bahramian,

- A., Cackett, E. M., Galvin, T. J., Heinke, C. O., Ludlam, R. [et al.]
Radio continuum studies of ultracompact and short orbital period X-ray binaries, 2025,
ApJ, 988, 131
4. Shin, J., Hui, C. Y., Kim, S., **Kwangmin, Oh**, Owen, E. R.
A possible GeV–TeV connection in the direction of the globular cluster UKS 1, 2025, *A&A*,
 696, L11
5. **Kwangmin, Oh**, Dage, K. C., Bobrick, A., Aydi, E., Bahramian, A., Goodwin, A. J.,
 Haggard, D., Irwin, J., Kundu, A., Strader, J. [et al.]
*Spectral insights and evolutionary pathways of a globular-cluster ULX in NGC 1399: a
 two-decade X-ray and optical study*, 2025, *MNRAS*, 537, 3884–3894
6. Dage, K. C. et al., including **Kwangmin, Oh**
Detecting the black-hole-candidate population in M51’s young massive star clusters: constraints on accreting intermediate-mass black holes, 2025, *ApJ*, 979, 82
7. **Kwangmin, Oh**, Hong, J., Hui, C. Y., Kim, S., Giersz, M.
*Probing intracluster dynamics and evolution of globular clusters through cataclysmic
 variable populations*, 2024, *MNRAS*, 532, 259–269
8. Kim, S., Hui, C. Y., Yan, J., Leung, A. P., **Kwangmin, Oh**, Kong, A. K. H., Lin, L. C.-C., Li, K.-L.
Autoregressive search of gravitational waves: denoising, 2024, *Phys. Rev. D*, 109, 102003
9. **Kwangmin, Oh**, Hui, C. Y., Hong, J., Takata, J., Kong, A. K. H., Tam, P.-H. T., Li, K.-L., Cheng, K. S.
Influences of dynamical disruptions on the evolution of pulsars in globular clusters, 2023,
MNRAS, 525, 4167–4175
10. **Kwangmin, Oh**, Hui, C. Y., Li, K. L., Kong, A. K. H.
Multi-epoch X-ray imaging of globular cluster M62 with Chandra, 2020, *MNRAS*, 498,
 292–303
11. Hui, C. Y., Lee, J., Li, K. L., Kim, S., **Kwangmin, Oh**, Luo, S., Leung, A. P., Kong, A. K. H.,
 Takata, J., Cheng, K. S.
*Searches for pulsar-like candidates from unidentified objects in the Third Catalog of Hard
 Fermi-LAT Sources with machine-learning techniques*, 2020, *MNRAS*, 495, 1093–1109
12. Kim, S., Hui, C. Y., Lee, J., **Kwangmin, Oh**, Lin, L. C. C., Takata, J.
*A deep X-ray spectral imaging of the bow-shock pulsar wind nebula associated with PSR
 B1929+10*, 2020, *A&A*, 637, L7

Collaborative Publications

1. LIGO–Virgo–KAGRA Collaboration
Search for gravitational waves emitted from SN 2023ixf, 2024, *arXiv*, arXiv:2410.16565
2. LIGO–Virgo–KAGRA Collaboration
*A search using GEO600 for gravitational waves coincident with fast radio bursts from
 SGR 1935+2154*, 2024, *arXiv*, arXiv:2410.09151

- 3.** LIGO–Virgo–KAGRA Collaboration
Swift-BAT GUANO follow-up of gravitational-wave triggers in the third LIGO–Virgo–KAGRA observing run, 2024, arXiv, arXiv:2407.12867
- 4.** LIGO–Virgo–KAGRA Collaboration
Observation of Gravitational Waves from the Coalescence of a 2.5–4.5 M_{\odot} Compact Object and a Neutron Star, 2024, ApJL, 970
- 5.** LIGO–Virgo–KAGRA Collaboration
Ultralight vector dark matter search using data from the KAGRA O3GK run, 2024, Phys. Rev. D, 110, 042001
- 6.** LIGO–Virgo–KAGRA Collaboration
Constraints on the Cosmic Expansion History from GWTC-3, 2023, ApJ, 949, 76
- 7.** LIGO–Virgo–KAGRA Collaboration
Open Data from the Third Observing Run of LIGO, Virgo, KAGRA, and GEO, 2023, ApJS, 267, 29
- 8.** LIGO–Virgo–KAGRA Collaboration
Population of Merging Compact Binaries Inferred Using Gravitational Waves through GWTC-3, 2023, Phys. Rev. X, 13, 011048
- 9.** LIGO–Virgo–KAGRA Collaboration
Search for gravitational-lensing signatures in the full third observing run of the LIGO–Virgo network, 2023, arXiv, arXiv:2304.08393
- 10.** LIGO–Virgo–KAGRA Collaboration
Search for Eccentric Black Hole Coalescences during the Third Observing Run of LIGO and Virgo, 2023, arXiv, arXiv:2308.03822
- 11.** KAGRA Collaboration
Correction to: Input optics systems of the KAGRA detector during O3GK, 2023, PTEP, 2023, 059301
- 12.** LIGO–Virgo–KAGRA Collaboration
A Joint Fermi-GBM and Swift-BAT Analysis of Gravitational-Wave Candidates from the Third Gravitational-wave Observing Run, 2023, arXiv, arXiv:2308.13666
- 13.** LIGO–Virgo–KAGRA Collaboration
Search for subsolar-mass black hole binaries in the second part of Advanced LIGO’s and Advanced Virgo’s third observing run, 2023, MNRAS, 524, 5984–5992
- 14.** KAGRA Collaboration
Overview of KAGRA: Data transfer and management, 2023, PTEP, 2023, 10A102
- 15.** KAGRA Collaboration
Performance of the KAGRA detector during the first joint observation with GEO 600 (O3GK), 2022, PTEP, 2022, 10A101
- 16.** LIGO–Virgo–KAGRA Collaboration
Search for continuous gravitational waves from 20 accreting millisecond X-ray pulsars in

O3 LIGO data, 2022, *Phys. Rev. D*, 105, 022002

17. LIGO–Virgo–KAGRA Collaboration
All-sky search for gravitational wave emission from scalar boson clouds around spinning black holes in LIGO O3 data, 2022, *Phys. Rev. D*, 105, 102001
18. LIGO–Virgo–KAGRA Collaboration
Narrowband Searches for Continuous and Long-duration Transient Gravitational Waves from Known Pulsars in the LIGO–Virgo Third Observing Run, 2022, *ApJ*, 932, 133
19. LIGO–Virgo–KAGRA Collaboration
All-sky search for continuous gravitational waves from isolated neutron stars using Advanced LIGO and Advanced Virgo O3 data, 2022, *arXiv*, arXiv:2201.00697
20. LIGO–Virgo–KAGRA Collaboration
Search for intermediate-mass black hole binaries in the third observing run of Advanced LIGO and Advanced Virgo, 2022, *A&A*, 659, A84
21. LIGO–Virgo–KAGRA Collaboration
Search for Subsolar-Mass Binaries in the First Half of Advanced LIGO’s and Advanced Virgo’s Third Observing Run, 2022, *Phys. Rev. Lett.*, 129, 061104
22. LIGO–Virgo–KAGRA Collaboration
All-sky, all-frequency directional search for persistent gravitational waves from Advanced LIGO’s and Advanced Virgo’s first three observing runs, 2022, *Phys. Rev. D*, 105, 122001
23. LIGO–Virgo–KAGRA Collaboration
Performance of the KAGRA detector during the first joint observation with GEO 600 (O3GK), 2022, *arXiv*, arXiv:2203.07011
24. LIGO–Virgo–KAGRA Collaboration
Search for gravitational waves from Scorpius X-1 with a hidden Markov model in O3 LIGO data, 2022, *arXiv*, arXiv:2201.10104
25. LIGO–Virgo–KAGRA Collaboration
Search for continuous gravitational wave emission from the Milky Way center in O3 LIGO–Virgo data, 2022, *Phys. Rev. D*, 106, 042003
26. LIGO–Virgo–KAGRA Collaboration
Search for gravitational-wave transients associated with magnetar bursts in Advanced LIGO and Advanced Virgo data from the third observing run, 2022, *arXiv*, arXiv:2210.10931
27. KAGRA Collaboration
Input optics systems of the KAGRA detector during O3GK, 2022, *arXiv*:2210.05934
28. LIGO–Virgo–KAGRA Collaboration
Model-based cross-correlation search for gravitational waves from the low-mass X-ray binary Scorpius X-1 in LIGO O3 data, 2022, *arXiv*, arXiv:2209.02863
29. KAGRA Collaboration
Noise subtraction from KAGRA O3GK data using Independent Component Analysis, 2022, *arXiv*, arXiv:2206.05785

- 30.** LIGO–Virgo–KAGRA Collaboration, and CHIME/FRB Collaboration
Search for Gravitational Waves Associated with Fast Radio Bursts Detected by CHIME/FRB During the LIGO–Virgo Observing Run O3a, 2022, arXiv:2203.12038
- 31.** LIGO–Virgo–KAGRA Collaboration
Searches for Gravitational Waves from Known Pulsars at Two Harmonics in the Second and Third LIGO–Virgo Observing Runs, 2022, *ApJ*, 935, 1
- 32.** LIGO–Virgo–KAGRA Collaboration
Tests of General Relativity with GWTC-3, 2021, *arXiv*, arXiv:2112.06861
- 33.** LIGO–Virgo–KAGRA Collaboration
Constraints from LIGO O3 Data on Gravitational-wave Emission Due to R-modes in the Glitching Pulsar PSR J0537–6910, 2021, *ApJ*, 922, 71
- 34.** KAGRA Collaboration
Vibration isolation systems for the beam splitter and signal recycling mirrors of the KAGRA gravitational wave detector, 2021, *Class. Quantum Grav.*, 38(6), 065011