

# Aditya Vijaykumar

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PAPERS (SHORT  
AUTHORLIST)

- \* denotes joint first-author papers, † denotes student supervised.
- 30. †Neha Sharma, **Aditya Vijaykumar**, William E. East et al.  
*Rapid inference of gravitational-wave signals in the time domain using a heterodyned likelihood*  
Submitted to PRD, [arXiv:2601.11239](#).
  - 29. **Aditya Vijaykumar**, Amanda M. Farah, Maya Fishbach  
*The maximum mass ratio of hierarchical binary black hole mergers may cause the  $q\text{-}\chi_{\text{eff}}$  correlation*  
Submitted to ApJL, [arXiv:2601.03457](#).
  - 28. Amanda M. Farah, **Aditya Vijaykumar**, Maya Fishbach  
*The steep redshift evolution of the hierarchical binary black hole merger rate may cause the  $z\text{-}\chi_{\text{eff}}$  correlation*  
Submitted to ApJL, [arXiv:2601.03456](#).
  - 27. N.V. Krishnendu, Tamara Evstafyeva, \***Aditya Vijaykumar**, William E. East et al.  
*Implications of  $GW_{2410II}$  for rotating exotic compact objects*  
Submitted to PRL, [arXiv:2511.17341](#).
  - 26. Madison VanWyngarden, Maya Fishbach, **Aditya Vijaykumar**, Alexandra G. Guerrero, Daniel E. Holz  
*How Low Can You Go: Constraining the Effects of Catalog Incompleteness on Dark Siren Cosmology*  
Submitted to ApJ, [arXiv:2511.04786](#).
  - 25. Hui Tong et al. (including **Aditya Vijaykumar**)  
*Evidence of the pair instability gap in the distribution of black hole masses*  
Submitted to Nature, [arXiv:2509.04151](#).
  - 24. Colm Talbot et al. (including **Aditya Vijaykumar**)  
*Inference with finite time series II: the window strikes back*  
Submitted to CQG, [arXiv:2508.11091](#).
  - 23. Avinash Tiwari, Prolay Chanda, Shasvath J. Kapadia, Susmita Adhikari, **Aditya Vijaykumar**, Basudeb Dasgupta  
*Profiling Dark Matter Spikes with Gravitational Waves from Accelerated Binaries*  
Submitted to PRL, [arXiv:2508.03803](#).
  - 22. Andris Doroszmai, Isobel M. Romero-Shaw, **Aditya Vijaykumar**, Silvia Toonen, et al.  
*Hierarchical Triples vs. Globular Clusters: Binary black hole merger eccentricity distributions compete and evolve with redshift*  
Submitted to MNRAS, [arXiv:2507.23212](#).
  - 21. †Avinash Tiwari, **Aditya Vijaykumar**, Shasvath J. Kapadia, Shrobana Ghosh, Alex B. Nielsen  
*A pipeline to search for signatures of line-of-sight acceleration in gravitational wave signals produced by compact binary coalescences*  
Submitted to PRD, [arXiv:2506.22272](#).
  - 20. Kanchan Soni, **Aditya Vijaykumar**, Sanjit Mitra  
*Assessing the potential of LIGO-India in resolving the Hubble Tension*  
Submitted to CQG, [arXiv:2409.11361](#).
  - 19. †Avinash Tiwari, **Aditya Vijaykumar**, Shasvath J. Kapadia, Sourav Chatterjee, Giacomo Fragione  
*Profiling stellar environments of gravitational wave sources*  
*Phys. Rev. D* 112, 084034, [arXiv:2407.15117](#).
  - 18. Alexandra G. Hanselman, **Aditya Vijaykumar**, Maya Fishbach, Daniel E. Holz  
*Gravitational-wave dark siren cosmology systematics from galaxy weighting*  
*ApJ* 979 9, [arXiv:2405.14818](#).

17. Sreejith Nair, **\*Aditya Vijaykumar**, Sudipta Sarkar  
*Bounds on the charge of the graviton using gravitational wave observations*  
*JCAP* **11** (2024) 004, arXiv:2405.05038.
16. **\*Aditya Vijaykumar**, Alexandra G. Hanselman, Michael Zevin  
*Consistent eccentricities for gravitational wave astronomy: Resolving discrepancies between astrophysical simulations and waveform models*  
*ApJ* **969** 132, arXiv:2402.07892.
15. Mukesh Kumar Singh, Shasvath J. Kapadia **Aditya Vijaykumar**, Parameswaran Ajith  
*Impact of higher harmonics of gravitational radiation on the population inference of binary black holes*  
*ApJ* **971** 23, arXiv:2312.07376.
14. †Kruthi Krishna, **\*Aditya Vijaykumar**, Apratim Ganguly, et al  
*Accelerated parameter estimation in Bilby with relative binning*  
arXiv:2312.06009.
13. **Aditya Vijaykumar**, Maya Fishbach, Susmita Adhikari, Daniel E. Holz  
*Inferring host galaxy properties of LIGO-Virgo-KAGRA's black holes*  
*ApJ* **972** 157, arXiv:2312.03316.
12. Divyajyoti, N.V. Krishnendu, Muhammed Saleem, Marta Colleoni, **Aditya Vijaykumar**, K.G. Arun, Chandra Kant Mishra  
*Effect of double spin-precession and higher harmonics on spin-induced quadrupole moment measurements*  
*Phys. Rev. D* **109**, 023016, arXiv:2311.05506.
11. †Avinash Tiwari, **\*Aditya Vijaykumar**, Shasvath J. Kapadia, Giacomo Fragione, Sourav Chatterjee  
*Accelerated binary black holes in globular clusters: forecasts and detectability in the era of space-based gravitational-wave detectors*  
*MNRAS*, **527**, 8586, arXiv:2307.00930.
10. **Aditya Vijaykumar**, †Avinash Tiwari, Shasvath J. Kapadia, K.G. Arun, Parameswaran Ajith  
*Waltzing binaries: Probing line-of-sight acceleration of merging compact objects with gravitational waves*  
*ApJ* **954** 105, arXiv:2302.09651.  
*In press: Astrobites*
9. †Adhrit Ravichandran, **Aditya Vijaykumar**, Shasvath J. Kapadia, Prayush Kumar  
*Rapid Identification and Classification of Eccentric Gravitational Wave Inspirals with Machine Learning*  
Submitted to PRD, arXiv:2302.00666.
8. Srashni Goyal, **Aditya Vijaykumar**, Jose Maria Ezquiaga, Miguel Zumalacarregui  
*Probing lens-induced gravitational-wave birefringence as a test of general relativity*  
*Phys. Rev. D* **108**, 024052, arXiv:2301.04826.  
*In press: Astrobites*
7. Bikram Keshari Pradhan, **Aditya Vijaykumar**, Debarati Chatterjee  
*Impact of updated Multipole Love and f-Love Universal Relations in context of Binary Neutron Stars*  
*Phys. Rev. D* **107**, 023010, arXiv:2210.09425.
6. **Aditya Vijaykumar**, Shasvath J. Kapadia, Parameswaran Ajith  
*Can a binary neutron star merger in the vicinity of a supermassive black hole enable a detection of a post-merger gravitational wave signal?*  
*MNRAS*, **513**, 3577, arXiv:2202.08673.
5. **Aditya Vijaykumar**, Ajit Kumar Mehta, Apratim Ganguly  
*Detection and parameter estimation challenges of Type-II lensed binary black hole signals*  
*Phys. Rev. D* **108**, 043036, arXiv:2202.06334.
4. Sumit Kumar, **Aditya Vijaykumar**, Alexander H. Nitz  
*Detecting Baryon Acoustic Oscillations with third generation gravitational wave observatories*,  
*ApJ* **930** 113, arXiv:2110.06152.

3. M. Saleem, Javed Rana, V. Gayathri, \*Aditya Vijaykumar et al.  
*The Science Case for LIGO-India*  
*Class. Quantum Grav.* 39 025004, arXiv:2105.01716.
2. Aditya Vijaykumar, M. V. S. Saketh, Sumit Kumar, Parameswaran Ajith, Tirthankar Roy Choudhury  
*Probing the large scale structure using gravitational wave observations of binary black holes,*  
*Phys. Rev. D* 108, 103017, arXiv:2005.01111.  
*In press: Astrobites.*
1. Aditya Vijaykumar, Shasvath J. Kapadia, Parameswaran Ajith  
*Constraints on the time variation of the gravitational constant using gravitational wave observations of binary neutron stars,*  
*Phys. Rev. Lett.* 126, 141104, arXiv:2003.12832.  
*In press: phys.org.*

PAPERS (LONG  
AUTHORLIST,  
WITH  
SUBSTANTIAL  
CONTRIBUTION)

9. Abac et al. (LIGO Scientific, Virgo, and KAGRA Collaborations)  
*GW<sub>241011</sub> and GW<sub>241110</sub>: Exploring Binary Formation and Fundamental Physics with Asymmetric, High-spin Black Hole Coalescences,*  
*ApJL*, arXiv:2510.26931.
8. Abac et al. (LIGO Scientific, Virgo, and KAGRA Collaborations)  
*Upper Limits on the Isotropic Gravitational-Wave Background from the first part of LIGO, Virgo, and KAGRA's fourth Observing Run,*  
arXiv:2508.20721.
7. Abac et al. (LIGO Scientific, Virgo, and KAGRA Collaborations) [Paper Writing Team Lead]  
*GWTC-4.0: Population Properties of Merging Compact Binaries,*  
arXiv:2508.18083.
6. Abac et al. (LIGO Scientific, Virgo, and KAGRA Collaborations)  
*GWTC-4.0: Updating the Gravitational-Wave Transient Catalog with Observations from the First Part of the Fourth LIGO-Virgo-KAGRA Observing Run,*  
arXiv:2508.18082.
5. Abac et al. (LIGO Scientific, Virgo, and KAGRA Collaborations)  
*GW<sub>231123</sub>: a Binary Black Hole Merger with Total Mass 190-265 M<sub>⊙</sub>,*  
arXiv:2507.08219.
4. Abbott et al. (LIGO Scientific and Virgo Collaborations)  
*Tests of General Relativity with GWTC-3,*  
Accepted to *Physical Review D*, arXiv:2112.06861.
3. Abbott et al. (LIGO Scientific and Virgo Collaborations)  
*Tests of General Relativity with Binary Black Holes from the second LIGO-Virgo Gravitational-Wave Transient Catalog,*  
*Phys. Rev. D* 103 (2021) 12, 122002, arXiv:2010.14529.
2. Abbott et al. (LIGO Scientific and Virgo Collaborations)  
*GWTC-2: Compact Binary Coalescences Observed by LIGO and Virgo During the First Half of the Third Observing Run,*  
*Phys. Rev. X* 11 (2021) 021053, arXiv:2010.14527.
1. P. Virtanen et al. (including Aditya Vijaykumar as SciPy 1.0 Contributor)  
*SciPy 1.0—Fundamental Algorithms for Scientific Computing in Python,*  
*Nat Methods* 17, 261–272 (2020), arXiv:1907.10121.