

# 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  $q$ - $\chi_{\text{eff}}$  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  $z$ - $\chi_{\text{eff}}$  correlation*  
Submitted to ApJL, [arXiv:2601.03456](#).
27. N.V. Krishnendu, Tamara Evstafyeva, \***Aditya Vijaykumar**, William E. East et al.  
*Implications of GW241011 for rotating exotic compact objects*  
Submitted to PRL, [arXiv:2511.17341](#).
26. Madison Van Wyngarden, 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. <sup>†</sup>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. <sup>†</sup>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**, <sup>†</sup>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. <sup>†</sup>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. Srashti 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](#).  
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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](#).  
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PAPERS (LONG  
AUTHORLIST,  
WITH  
SUBSTANTIAL  
CONTRIBUTION)

9. Abac et al. (LIGO Scientific, Virgo, and KAGRA Collaborations)  
*GW241011 and GW241110: 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)  
*GW231123: a Binary Black Hole Merger with Total Mass  $190-265 M_{\odot}$* ,  
[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](#).