Debatri Chattopadhyay

debatri.chattopadhyay@northwestern.edu
orcid.org/0000-0001-5867-5033

8 first author papers (highlighted in blue), 5 second author including student-led papers (highlighted in blue), 5 LIGO-Virgo-KAGRA collaboration papers where direct contributions were made, 28 accepted papers, and 7 submitted for peer-review.
35 in total number of papers.
3 chosen highlighted with asterisk symbol.
h-index:22, i10-index:27, Citations: 6193.

Research Publications

2025 Antonini, Fabio, Thomas Callister, et al. (Sept. 2025). "Inferring the pair-instability mass gap from gravitational wave data". In: 112.6, 063040, p. 063040. DOI: 10.1103/nxnr-pdyx. arXiv: 2506.09154 [astro-ph.HE].

Antonini, Fabio, Isobel Romero-Shaw, et al. (Sept. 2025). "Gravitational waves reveal the pair-instability mass gap and constrain nuclear burning in massive stars". In: *arXiv e-prints*, arXiv:2509.04637, arXiv:2509.04637. DOI: 10.48550/arXiv.2509.04637. arXiv: 2509.04637 [astro-ph.HE].

Chattaraj, Abhishek et al. (July 2025). "Forming Double Neutron Stars using Detailed Binary Evolution Models with POSYDON: Comparison to the Galactic Systems". In: *arXiv e-prints*, arXiv:2508.00186, arXiv:2508.00186. DOI: 10.48550/arXiv.2508.00186. arXiv: 2508.00186 [astro-ph.SR].

Fantoccoli, Federico et al. (Mar. 2025). "Properties of black hole-star binaries formed in N-body simulations of massive star clusters: implications for Gaia black holes". In: 538.1, pp. 243–257. DOI: 10.1093/mnras/staf303. arXiv: 2410.17323 [astro-ph.GA].

Mahapatra, Parthapratim, **Debatri Chattopadhyay**, Anuradha Gupta, Fabio Antonini, et al. (June 2025). "Possible binary neutron star merger history of the primary of GW230529". In: 111.12, 123030, p. 123030. DOI: 10.1103/c9l3-gw6w. arXiv: 2503.17872 [astro-ph.HE].

Mahapatra, Parthapratim, **Debatri Chattopadhyay**, Anuradha Gupta, Marc Favata, et al. (Jan. 2025). "Predictions of a simple parametric model of hierarchical black hole mergers". In: 111.2, 023013, p. 023013. DOI: 10.1103/PhysRevD.111.023013. arXiv: 2209.05766 [astro-ph.HE].

Chattopadhyay, Debatri, Kyle A. Rocha, Seth Gossage, and Vicky Kalogera (Oct. 2025). "Evolutionary Links: From Gaia Neutron Star Binaries to Pulsar White Dwarf Endpoints". In: *arXiv e-prints*, arXiv:2510.11828, arXiv:2510.11828. DOI: 10.48550/arXiv.2510.11828. arXiv: 2510.11828 [astro-ph.SR].

* **Chattopadhyay, Debatri**, Kyle A. Rocha, Seth Gossage, Vicky Kalogera, et al. (Oct. 2025). "Modelling the Future of Gaia Neutron Star-Main Sequence Binaries: From Eccentric Orbits to Millisecond Pulsar-White Dwarfs". In: *arXiv e-prints*, arXiv:2510.16201, arXiv:2510.16201. DOI: 10.48550/arXiv.2510.16201. arXiv: 2510.16201 [astro-ph.SR].

Chattopadhyay, Debatri, Sama Al-Shammari, et al. (Jan. 2025). "The impact of astrophysical priors on parameter inference for GW230529". In: 536.1, pp. L19–L25. DOI: 10.1093/mnrasl/slae099. arXiv: 2407.08719 [astro-ph.HE].

Song, Yuzhe, **Debatri Chattopadhyay**, et al. (Nov. 2025). "Modelling Millisecond Pulsar Populations in Globular Clusters with NBODY6++GPU". In: *arXiv e-prints*, arXiv:2511.08850, arXiv:2511.08850. DOI: 10.48550/arXiv.2511.08850. arXiv: 2511.08850 [astro-ph.HE].

Song, Yuzhe, Simon Stevenson, et al. (Sept. 2025). "Binary population synthesis of the Galactic canonical pulsar population". In: 42, e131, e131. DOI: 10.1017/pasa.2025.10092. arXiv: 2406.11428 [astro-ph.HE].

The LIGO Scientific Collaboration et al. (Aug. 2025). "GWTC-4.0: Population Properties of Merging Compact Binaries". In: *arXiv e-prints*, arXiv:2508.18083, arXiv:2508.18083. DOI: 10.48550/arXiv.2508.18083. arXiv: 2508.18083 [astro-ph.HE].

2024 Abac, A. G. et al. (Aug. 2024). "Observation of Gravitational Waves from the Coalescence of a 2.5–4.5 $M_\odot$ Compact Object and a Neutron Star". In: 970.2, L34, p. L34. DOI: 10.3847/2041-8213/ad5beb. arXiv: 2404.04248 [astro-ph.HE].

Abbott, R., T. D. Abbott, F. Acernese, et al. (Jan. 2024). "GWTC-2.1: Deep extended catalog of compact binary coalescences observed by LIGO and Virgo during the first half of the third observing run". In: 109.2, 022001, p. 022001. DOI: 10.1103/PhysRevD.109.022001. arXiv: 2108.01045 [gr-qc].

Barber, Jordan, **Debatri Chattopadhyay**, and Fabio Antonini (Jan. 2024). "Black hole binary mergers in dense star clusters: the importance of primordial binaries". In: 527.3, pp. 7363–7381. DOI: 10.1093/mnras/stad3600. arXiv: 2310.02376 [astro-ph.GA].

Chandra, Koustav et al. (May 2024a). "Everything everywhere all at once: A detailed study of GW230529". In: *arXiv e-prints*, arXiv:2405.03841, arXiv:2405.03841. DOI: 10.48550/arXiv.2405.03841. arXiv: 2405.03841 [astro-ph.HE].

Chandra, Koustav et al. (Dec. 2024b). "On the Origins, Remnant, and Multimessenger Prospects of the Compact Binary Merger GW230529". In: 977.2, 167, p. 167. DOI: 10.3847/1538-4357/ad90bd.

Mahapatra, Parthapratim, **Debatri Chattopadhyay**, Anuradha Gupta, Fabio Antonini, et al. (Nov. 2024). "Reconstructing the Genealogy of LIGO-Virgo Black Holes". In: 975.1, 117, p. 117. DOI: 10.3847/1538-4357/ad781b. arXiv: 2406.06390 [astro-ph.HE].

Mahapatra, Parthapratim, **Debatri Chattopadhyay**, Anuradha Gupta, Marc Favata, et al. (Jan. 2024). "Black hole hierarchical growth efficiency and mass spectrum predictions". In: *42nd meeting of the Astronomical Society of India (ASI)*. Vol. 42, O42, O42.

2023 Antonini, Fabio, Mark Gieles, et al. (June 2023). "Coalescing black hole binaries from globular clusters: mass distributions and comparison to gravitational wave data from GWTC-3". In: 522.1, pp. 466–476. DOI: 10.1093/mnras/stad972. arXiv: 2208.01081 [astro-ph.HE].

Gupta, Ish et al. (June 2023). "Neutron star-black hole mergers in next generation gravitational-wave observatories". In: 107.12, 124007, p. 124007. DOI: 10.1103/PhysRevD.107.124007. arXiv: 2301.08763 [gr-qc].

* **Chattopadhyay, Debatri**, Jakob Stegmann, et al. (Dec. 2023). "Double black hole mergers in nuclear star clusters: eccentricities, spins, masses, and the growth of massive seeds". In: 526.4, pp. 4908–4928. DOI: 10.1093/mnras/stad3048. arXiv: 2308.10884 [astro-ph.HE].

Sgalletta, Cecilia et al. (Dec. 2023). "Binary neutron star populations in the Milky Way". In: 526.2, pp. 2210–2229. DOI: 10.1093/mnras/stad2768. arXiv: 2305.04955 [astro-ph.HE].

2022 Belczynski, K. et al. (Jan. 2022). "The Uncertain Future of Massive Binaries Obscures the Origin of LIGO/Virgo Sources". In: 925.1, 69, p. 69. DOI: 10.3847/1538-4357/ac375a. arXiv: 2108.10885 [astro-ph.HE].

Belczynski, Krzysztof et al. (Aug. 2022). "Black Hole-Black Hole Total Merger Mass and the Origin of LIGO/Virgo Sources". In: 935.2, 126, p. 126. DOI: 10.3847/1538-4357/ac8167. arXiv: 2204.11730 [astro-ph.HE].

Broekgaarden, Floor S., Edo Berger, Simon Stevenson, et al. (Nov. 2022). "Impact of massive binary star and cosmic evolution on gravitational wave observations - II. Double compact object rates and properties". In: 516.4, pp. 5737–5761. DOI: 10.1093/mnras/stac1677. arXiv: 2112.05763 [astro-ph.HE].

Compas, Team et al. (Jan. 2022). "COMPAS: A rapid binary population synthesis suite". In: *The Journal of Open Source Software* 7.69, 3838, p. 3838. DOI: 10.21105/joss.03838.

Chattopadhyay, **Debatri**, Jarrod Hurley, et al. (July 2022). "Dynamical double black holes and their host cluster properties". In: 513.3, pp. 4527–4555. DOI: 10.1093/mnras/stac1163. arXiv: 2202.08924 [astro-ph.GA].

Chattopadhyay, **Debatri**, Simon Stevenson, Floor Broekgaarden, et al. (July 2022). "Modelling the formation of the first two neutron star-black hole mergers, GW200105 and GW200115: metallicity, chirp masses, and merger remnant spins". In: 513.4, pp. 5780–5789. DOI: 10.1093/mnras/stac1283. arXiv: 2203.05850 [astro-ph.HE].

Riley, Jeff et al. (Feb. 2022). "Rapid Stellar and Binary Population Synthesis with COMPAS". In: 258.2, 34, p. 34. DOI: 10.3847/1538-4365/ac416c. arXiv: 2109.10352 [astro-ph.IM].

Sarin, Nikhil et al. (Apr. 2022). "Linking the rates of neutron star binaries and short gamma-ray bursts". In: 105.8, 083004, p. 083004. DOI: 10.1103/PhysRevD.105.083004. arXiv: 2201.08491 [astro-ph.HE].

Stegmann, Jakob et al. (July 2022). "Binary black hole mergers from merged stars in the Galactic field". In: 106.2, 023014, p. 023014. DOI: 10.1103/PhysRevD.106.023014. arXiv: 2203.16544 [astro-ph.GA].

2021 Abbott, R., T. D. Abbott, S. Abraham, F. Acernese, K. Ackley, A. Adams, C. Adams, R. X. Adhikari, V. B. Adya, C. Affeldt, M. Agathos, K. Agatsuma, N. Aggarwal, O. D. Aguiar, L. Aiello, A. Ain, P. Ajith, S. Akcay, et al. (Apr. 2021). "GWTC-2: Compact Binary Coalescences Observed by LIGO and Virgo during the First Half of the Third Observing Run". In: *Physical Review X* 11.2, 021053, p. 021053. DOI: 10.1103/PhysRevX.11.021053. arXiv: 2010.14527 [gr-qc].

Abbott, R., T. D. Abbott, S. Abraham, F. Acernese, K. Ackley, A. Adams, C. Adams, R. X. Adhikari, V. B. Adya, C. Affeldt, M. Agathos, K. Agatsuma, N. Aggarwal, O. D. Aguiar, L. Aiello, A. Ain, P. Ajith, G. Allen, et al. (May 2021). "Population Properties of Compact Objects from the Second LIGO-Virgo Gravitational-Wave Transient Catalog". In: 913.1, L7, p. L7. DOI: 10.3847/2041-8213/abe949. arXiv: 2010.14533 [astro-ph.HE].

Broekgaarden, Floor S., Edo Berger, Coenraad J. Neijssel, et al. (Dec. 2021). "Impact of massive binary star and cosmic evolution on gravitational wave observations I: black hole-neutron star mergers". In: 508.4, pp. 5028–5063. DOI: 10.1093/mnras/stab2716. arXiv: 2103.02608 [astro-ph.HE].

Mandel, Ilya et al. (Jan. 2021). "Binary population synthesis with probabilistic remnant mass and kick prescriptions". In: 500.1, pp. 1380–1384. DOI: 10.1093/mnras/staa3390. arXiv: 2007.03890 [astro-ph.HE].

* **Chattopadhyay**, **Debatri**, Simon Stevenson, Jarrod R. Hurley, Matthew Bailes, et al. (July 2021). "Modelling neutron star-black hole binaries: future pulsar surveys and gravitational wave detectors". In: 504.3, pp. 3682–3710. DOI: 10.1093/mnras/stab973. arXiv: 2011.13503 [astro-ph.HE].

2020 Ackley, K. et al. (Nov. 2020). "Neutron Star Extreme Matter Observatory: A kilohertz-band gravitational-wave detector in the global network". In: 37, e047, e047. DOI: 10.1017/pasa.2020.39. arXiv: 2007.03128 [astro-ph.HE].

Chattopadhyay, **Debatri**, Simon Stevenson, Jarrod R. Hurley, Luca J. Rossi, et al. (May 2020). "Modelling double neutron stars: radio and gravitational waves". In: 494.2, pp. 1587–1610. DOI: 10.1093/mnras/staa756. arXiv: 1912.02415 [astro-ph.HE].

2019 Saha, Preetha et al. (Nov. 2019). "A study of Kepler supernova remnant: angular power spectrum estimation from radio frequency data". In: 489.4, pp. 5866–5875. DOI: 10.1093/mnras/stz2528. arXiv: 1909.03195 [astro-ph.GA].