

Bhaskar Biswas, Ph.D.

✉ bhaskar.biswas@uni-hamburg.de
🌐 <https://bhaskar-astro.github.io>

🐦 [twitter](#)

🌐 [linkedin](#)



Employment History

- 2023 – ···· 📌 **Postdoctoral researcher**, Hamburg Observatory, Hamburg, Germany
- 2021 – 2023 📌 **Postdoctoral researcher**, Oskar Klein Centre, Stockholm, Sweden
- 2018 – 2021 📌 **Member**, Ligo Scientific collaboration

Education

- 2016 – 2021 📌 **Ph.D., IUCAA Pune, India, Thesis**
Thesis title: *Constraining the equation of state of neutron stars using multimessenger observations*
Thesis supervisor: *Prof. Sukanta Bose*
- 2014 – 2016 📌 **M.Sc. Physics** Presidency University, Kolkata, India.
Thesis title: *How much inflation is there: Study by phase space analysis.*
- 2011 – 2014 📌 **B.Sc. Physics** Presidency University, Kolkata, India.

Research interests

- 📌 General Relativity and strong gravity
- 📌 Neutron star and its equation of state
- 📌 Relativistic tides
- 📌 Gravitational waves
- 📌 Numerical relativity and smooth particle hydrodynamics
- 📌 Bayesian statistics and data analysis

Research Publications

Journal Articles

- 1 B. Biswas, E. Smyrniotis, I. Liodis, and N. Stergioulas, “A Bayesian investigation of the neutron star equation-of-state vs. gravity degeneracy,” Sep. 2023. arXiv: 2309.05420 [gr-qc].
- 2 P. Tiwari, D. Zhou, B. Biswas, M. M. Forbes, and S. Bose, “Framework for Multi-messenger Inference from Neutron Stars: Combining Nuclear Theory Priors,” Jun. 2023. arXiv: 2306.04386 [astro-ph.HE].
- 3 B. Biswas, “Bayesian Model Selection of Neutron Star Equations of State Using Multi-messenger Observations,” *Astrophys. J.*, vol. 926, no. 1, p. 75, 2022. 📄 DOI: 10.3847/1538-4357/ac447b. arXiv: 2106.02644 [astro-ph.HE].
- 4 B. Biswas and S. Datta, “Constraining neutron star properties with a new equation of state insensitive approach,” *Phys. Rev. D*, vol. 106, no. 4, p. 043012, 2022. 📄 DOI: 10.1103/PhysRevD.106.043012. arXiv: 2112.10824 [astro-ph.HE].
- 5 T. Ghosh, B. Biswas, and S. Bose, “Simultaneous inference of neutron star equation of state and the Hubble constant with a population of merging neutron stars,” *Phys. Rev. D*, vol. 106, no. 12, p. 123529, 2022. 📄 DOI: 10.1103/PhysRevD.106.123529. arXiv: 2203.11756 [astro-ph.CO].

- 6 B. Biswas, "Impact of PREX-II and Combined Radio/NICER/XMM-Newton's Mass-radius Measurement of PSR J0740+6620 on the Dense-matter Equation of State," *Astrophys. J.*, vol. 921, no. 1, p. 63, 2021. [DOI: 10.3847/1538-4357/ac1c72](https://doi.org/10.3847/1538-4357/ac1c72). arXiv: 2105.02886 [astro-ph.HE].
- 7 B. Biswas, P. Char, R. Nandi, and S. Bose, "Towards mitigation of apparent tension between nuclear physics and astrophysical observations by improved modeling of neutron star matter," *Phys. Rev. D*, vol. 103, no. 10, p. 103 015, 2021. [DOI: 10.1103/PhysRevD.103.103015](https://doi.org/10.1103/PhysRevD.103.103015). arXiv: 2008.01582 [astro-ph.HE].
- 8 B. Biswas, R. Nandi, P. Char, S. Bose, and N. Stergioulas, "GW190814: on the properties of the secondary component of the binary," *MNRAS*, vol. 505, no. 2, pp. 1600–1606, Aug. 2021. [DOI: 10.1093/mnras/stab1383](https://doi.org/10.1093/mnras/stab1383). arXiv: 2010.02090 [astro-ph.HE].
- 9 B. Biswas and S. Bose, "Tidal deformability of an anisotropic compact star: Implications of GW170817," *Phys. Rev. D*, vol. 99, no. 10, p. 104 002, 2019. [DOI: 10.1103/PhysRevD.99.104002](https://doi.org/10.1103/PhysRevD.99.104002). arXiv: 1903.04956 [gr-qc].
- 10 B. Biswas, R. Nandi, P. Char, and S. Bose, "Role of crustal physics in the tidal deformation of a neutron star," *Phys. Rev. D*, vol. 100, no. 4, p. 044 056, 2019. [DOI: 10.1103/PhysRevD.100.044056](https://doi.org/10.1103/PhysRevD.100.044056). arXiv: 1905.00678 [gr-qc].

Talks


Contributed talks/Posters


- 01/2019 📌 **Accounting for realistic effects in tidal deformation of Neutron star**, Talk, at 30th meeting of the Indian Association for General Relativity and Gravitation (IAGRG), BITS PILANI, Hyderabad, India
- 07/2019 📌 **Tidal deformability of an anisotropic compact star: Implications for GW170817**, Talk, at 22nd International Conference on General Relativity and Gravitation (GR22 and AMALDI13), Valencia
- 01/2020 📌 **Accounting realistic effects in tidal deformation of Neutron stars**, Talk, at Advances in Astroparticle Physics and Cosmology, AAPCOS-2020, Saha Institute of Nuclear Physics, Kolkata
- 12/2020 📌 **GW190814: On the properties of the secondary component of the binary**, Online Poster, 31st meeting of the Indian Association for General Relativity and Gravitation (IAGRG)
- 02/2021 📌 **GW190814: On the properties of the secondary component of the binary**, Online Talk, Astronomical Society of India
- 03/2021 📌 **GW190814: On the properties of the secondary component of the binary**, Online Talk, Meeting of the National Research Group on Gravitational Waves, Institut Henri Poincaré
- 07/2021 📌 **Constraining the equation of state of neutron stars using multimessenger observations**, Online talk, Edoardo Amaldi Conference on Gravitational Waves
- 07/2022 📌 **Constraining the equation of state of neutron stars using multimessenger observations**, Online talk, 23rd International Conference on General Relativity and Gravitation, "GR23"
- 04/2023 📌 **Exploring fundamental physics with neutron stars**, Talk, Quantum Universe Day, DESY campus, Germany
- 06/2023 📌 **Constraining the equation of state of neutron stars using multi-messenger observations**, Talk, GWsNS summer school, Aussois-Modane, France
- 07/2023 📌 **Constraining neutron star properties with a new equation of state insensitive approach**, Online Talk, Amaldi15
- 09/2023 📌 **Multimessenger inference of neutron star equation of state and gravity**, Talk, MICRA conference, Trento, Italy


Talks (continued)


10/2023  **Multimessenger investigation on the neutron star equation-of-state-gravity degeneracy**, Talk, OKC@15 workshop, Stockholm, Sweden


Invited talks

10/2020  **Constraining Neutron star equation of state using existing and upcoming astrophysical observations**, Online talk, Presidency University, Kolkata, Youtube link

 **Constraining Neutron star equation of state using existing and upcoming astrophysical observations**, Online talk, Nuclear Theory Group, India, Youtube link


07/2022  **Constraining the equation of state of neutron stars using multimessenger observations**, Talk, Aristotle University of Thessaloniki, Greece, Link


10/2022  **Constraining the neutron star equation of state and the Hubble constant using existing and upcoming astrophysical observations**, Talk, Hamburg Observatory, Germany


01/2023  **Constraining the neutron star equation of state and the Hubble constant using existing and upcoming astrophysical observations**, Talk, IUCAA, Pune


07/2022  **Probing nuclear physics and cosmology with neutron stars**, Talk, online workshop, NIT Rourkella, India

School participation

07/2018  **Summer School on Gravitational wave Astronomy**, , Outside to the traditional scope of GW physics, International Centre for Theoretical Sciences (ICTS-TIFR), Bengaluru, India

07/2019  **Summer School on Gravitational wave Astronomy**, physics and astrophysics of compact objects, International Centre for Theoretical Sciences (ICTS-TIFR), Bengaluru, India

03/2021  **IHP Trimester**, Gravitational waves: a new messenger to explore the universe, Institut Henri Poincaré in Paris, France


06/2023  **GWsNS summer school**, Gravitational wave emission from proto-neutron stars and neutron star mergers, Aussios-Modane, France


Skills

Languages  Bengali, English, Hindi

Coding  Fortran, Python

Fellowships & Awards

2010  **Fellowship**, Inspire, awarded by ministry of science and technology, India





2015  **Fellowship**, National Eligibility Test (NET), awarded UGC Junior Research Fellowship in CSIR-UGC NET exam

2021  **Thesis Prize**, honorable mention for the 2021 GWIC-Braccini Thesis Prize




2022  **Travel grant**, Ao3 call of AHEAD-2020, Visited university of Thessaloniki, Greece for two weeks

2023  **Travel grant**, Ao5 call of AHEAD-2020, Visited university of Thessaloniki, Greece for two weeks

Teaching, service, and outreach

- 2017 – 2019  **Teaching assistant**, IUCAA, Pune, India, Served as a teaching assistant in IUCAA grad school on Statistical Mechanics course
- 2022 –  **Referee**, Physical Review, MDPI
- 2016 – 2021  **Public outreach**, National Science Day, IUCAA, Pune, India, participated to organize poster session
- 2020  **Scientific blog**, for the young researchers on Ligo-India science

References

- Prof.Sukanta Bose**  Senior Professor,
Washington State University,
E-mail : sukanta@wsu.edu
- Prof. Stephan Rosswog**  Senior Professor,
Oskar Klein Centre, Stockholm University,
E-mail : stephan.rosswog@astro.su.se
- Prof. Nikolaos Stergioulas**  Senior Professor,
Aristotle University of Thessaloniki,
E-mail : niksterg@auth.gr