Mudit Garg
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Education

08/2021 – *07/2025*	PhD in Gravitational Wave Astrophysics **University of Zurich** Advisor: Prof. Lucio Mayer
09/2018 – 12/2020	Master of Science in Physics **with distinction** GPA: 5.87/6 **ETH Zurich** Thesis supervisor: Prof. Lavinia Heisenberg *Relativistic, ghost-free, and covariant hybrid model for MOND: f(Q)*
07/2014 – 06/2018	Bachelor of Technology in Engineering Physics GPA: 8.15/10 **IIT Delhi** Thesis supervisor: Prof. Ajit Kumar *Geodesics near a charged black hole in* $\left(R \pm \mu^4/R\right)$ *gravity*

Publications - 6 First authored, 2 Co-authored, 2 Pre-PhD

ADS Library

2024 #10	**MG**, Alessia Franchini, Alessandro Lupi, Matteo Bonetti, Lucio Mayer, *Gas-induced perturbations on the gravitational wave inspiral of live post-Newtonian LISA massive black hole binaries*, Submitted to ApJL on 24$^{\text{th}}$ October
2024 #9	**MG**, Laura Sberna, Lorenzo Speri, Francisco Duque, Jonathan Gair, *Systematics in tests of general relativity using LISA massive black hole binaries*, Submitted to MNRAS on 7$^{\text{th}}$ October
2024 #8	**MG**, Christopher Tiede, Daniel J. D'Orazio, *Accretion mediated spin-eccentricity correlations in LISA massive black hole binaries*, MNRAS, 534, 3705
2024 #7	**MG**, Andrea Derdzinski, Shubhanshu Tiwari, Jonathan Gair, Lucio Mayer, *Measuring eccentricity and gas-induced perturbation from gravitational waves of LISA massive black hole binaries*, MNRAS, 532, 4060
2024 #6	**MG**, Shubhanshu Tiwari, Andrea Derdzinski, John G. Baker, Sylvain Marsat, Lucio Mayer, *The minimum measurable eccentricity from gravitational waves of LISA massive black hole binaries*, MNRAS, 528, 4176
2022 #5	**MG**, Andrea Derdzinski, Lorenz Zwick, Pedro R. Capelo, Lucio Mayer, *The imprint of gas on gravitational waves from LISA intermediate-mass black hole binaries*, MNRAS, 517, 1339
2024 #4	En-Kun Li, [19 authors], **MG**, [31 authors], *Gravitational Wave Astronomy With TianQin*, ADS
2022 #3	Lorenz Zwick, Andrea Derdzinski, **MG**, Pedro R. Capelo, Lucio Mayer, *Dirty waveforms: multiband harmonic content of gas-embedded gravitational wave sources*, MNRAS, 511, 6143
2020 #2	Fabio D'Ambrosio, **MG**, Lavinia Heisenberg (alphabetical order), *Non-linear extension of non-metricity scalar for MOND*, PLB, 811, 135970
2020 #1	Fabio D'Ambrosio, **MG**, Lavinia Heisenberg, Stefan Zentarra (alphabetical order), *ADM formulation and Hamiltonian analysis of Coincident General Relativity*, ADS

Selected Talks - 6 seminars, 1 invited + 6 contributed conferences, and 7 individual

10/2024	**CTC Theory Seminar** at University of Maryland [25+25 minutes] *Decoding Astrophysics from inspiraling LISA MBHBs*	College Park
09/2024	**Astrophysics Seminar** at John Hopkins University [45+15 minutes] *Decoding Astrophysics from inspiraling LISA MBHBs*	Baltimore
09/2024	**Astro Seminar** at Columbia University *Decoding Astrophysics from inspiraling LISA MBHBs*	NYC

06/2024	**GRAPPA Seminar** at University of Amsterdam [45+15 minutes] *Astrophysical signatures on the LISA data stream from MBHBs*	Amsterdam
05/2024	**Cosmology Seminar** at Max Planck Institute for Astrophysics *Astrophysical signatures on GWs from LISA MBHBs*	Garching
02/2024	**DAMTP GR Seminar** at University of Cambridge [50+10 minutes] *Astrophysical signatures on the LISA data stream from MBHBs*	Cambridge
08/2024	**Conference (Invited)**: New ideas on the origin of BH mergers Niels Bohr Institute *Astrophysical signatures on the LISA data stream from MBHBs*	Copenhagen
11/2024	**Meeting:** LISA Astrophysics Working Group at MPA *What solves the 'final parsec' problem for LISA Massive Black Hole Binaries?*	Garching
09/2023	**Meeting:** LISA Astrophysics Working Group at University of Milano-Bicocca *The minimum measurable eccentricity from GWs of LISA MBHBs*	Milan
07/2023	**Conference:** GW populations: what's next? at University of Milano-Bicocca *The measurability of gas and eccentricity from GWs of LISA MBHBs*	Milan
11/2022	**Conference:** LISA data analysis: classical methods to machine learning CNRS, L2IT, APC, CEA, and CNES *The imprint of Gas on GWs from LISA IMBHBs*	Toulouse
09/2022	**Conference:** Origin, growth and feedback of BHs in dwarf galaxies Donostia International Physics Center *The imprint of Gas on GWs from LISA IMBHBs*	San Sebastian
05/2022	**Conference:** IMBHs: New Science from Stellar Evolution to Cosmology CIERA, Northwestern University *Gas impact on GWs from LISA IMBHBs*	San Juan
10/2024	**CIERA theory group meeting** at Northwestern University *Decoding Astrophysics from inspiraling LISA MBHBs*	Evanston
09/2024	**Branch Lunch** at NASA Goddard *Decoding Astrophysics from inspiraling LISA MBHBs*	Greenbelt
09/2024	**Astro Coffee** at Institute of Advanced Study *Measuring eccentricity and gas-induced perturbation from GWs of LISA MBHBs*	Princeton
09/2024	**Monday Afternoon Talks** at MIT Kavli Institute *Decoding Astrophysics from inspiraling LISA MBHBs*	Boston
07/2024	**15$^{\text{th}}$ LISA Symposium** at University College Dublin *Poster: Astrophysical signatures on the LISA data stream from MBHBs*	Dublin
	LISA Call	Online
02/2025	Systematics in tests of GR using LISA MBHBs (invited)	Community
06/2024	Measuring eccentricity and gas from GWs of LISA MBHBs	Community
07/2023	Measuring eccentricity from GWs of LISA MBHBs	Data Challenge Working Group

Research visits

10/2024	**Center for Interdisciplinary Exploration and Research in Astrophysics (CIERA)** *Host: Prof. Shane Larson*	Evanston
09/2024	**Center for Computational Astrophysics (CCA), Flatiron Institute** *Host: Prof. Will Farr, Dr. Yan-Fei Jiang, and Dr. Matteo Cantiello*	NYC
02/2024	**Institute of Gravitational Wave Astronomy** *Host: Prof. Alberto Vecchio*	Birmingham
02/2024	**Institute of Cosmology and Gravitation** *Host: Prof. Ian Harry*	Portsmouth
11/2023	**Max Planck Institute for Gravitational Physics (Albert Einstein Institute)** *Host: Dr. Jonathan Gair*	Potsdam

Programs/Schools

09/2024	**Workshop**: Fundamental Physics Meets Waveforms With LISA *Max Planck Institute for Gravitational Physics (Albert Einstein Institute)*	Potsdam
09/2023	**Kavli-Villum School:** Gravitational Waves *Corfu Summer Institute*	Corfu
11/2022	**Workshop:** LISA data analysis: classical methods to machine learning *CNRS, L2IT, APC, CEA, and CNES*	Toulouse
07/2022	**Workshop:** LISA Data Challenge Workshop *LISA Data Challenge Working Group*	Online
01/2022	**Saas-Fee School:** Multi-Messenger GW Astronomy *Swiss Society for Astrophysics and Astronomy*	Saas-Fee
08/2021	**NBIA School:** Gravitational wave astrophysics *Niels Bohr Institute, University of Copenhagen*	Copenhagen

Professional responsibilities and memberships

2023 –	Organizer of the 'GWs, BHs, and Compact Binaries' seminar *Department of Astrophysics, University of Zurich*
2022 –	Contributor to the LISA DiscIMRI hydrodynamical code comparison project *Tasks: Literature review, plot making, and text writing*
2021 –	Member of the LISA consortium, its astrophysics, waveforms, and data challenge working groups, and its early career scientist group (LECS)
2021 –	Teaching assistant for several astrophysics courses at the University of Zurich
2021	Research assistant at the Department of Astrophysics, University of Zurich

Skills

Software and programming language

- lisabeta: Experienced user and frequently edits it to suit a given project's needs. It provides a complete LISA response and Bayesian inference primarily using the ptmcmc sampler.
- Eryn: I have performed reversible jump MCMC with this sampler in lisabeta.
- Mathematica: Frequent user to do analysis and plotting.
- Python: I mainly use this programming language to perform analysis and make plots.

Languages: English | German (A1.1) | Hindi