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 - 5 First authored, 2 Co-authored, 2 Pre-PhD

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
2024 #8	**MG**, Christopher Tiede, Daniel J. D'Orazio, *Accretion mediated spin-eccentricity correlations in LISA massive black hole binaries*, Accepted by MNRAS
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] ADS *Gravitational Wave Astronomy With TianQin*
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) PLB *Non-linear extension of non-metricity scalar for MOND*
2020 #1	Fabio D'Ambrosio, **MG**, Lavinia Heisenberg, Stefan Zentarra (alphabetical order) ADS *ADM formulation and Hamiltonian analysis of Coincident General Relativity*

Selected Talks/Presentations

11/2024	**Meeting:** LISA Astrophysics Working Group at MPA Garching *TBD*
10/2024	**CIERA theory group meeting** at Northwestern University Evanston *Decoding Astrophysics from inspiraling LISA MBHBs*
10/2024	**CTC Theory Seminar** at University of Maryland College Park *Decoding Astrophysics from inspiraling LISA MBHBs*
09/2024	**Astrophysics Seminar** at JHU Baltimore *Decoding Astrophysics from inspiraling LISA MBHBs*
09/2024	**Branch Lunch** at NASA Goddard Greenbelt *Decoding Astrophysics from inspiraling LISA MBHBs*

09/2024	**Astro Coffee** at Institute of Advanced Study *Measuring eccentricity and gas-induced perturbation from GWs of LISA MBHBs*	Princeton
09/2024	**Astro Seminar** at Columbia University *Decoding Astrophysics from inspiraling LISA MBHBs*	NYC
09/2024	**Monday Afternoon Talks** at MIT Kavli Institute *Decoding Astrophysics from inspiraling LISA MBHBs*	Boston
09/2024	**Meeting:** The Swiss Physical Society at ETH Zurich *Decoding Astrophysics from inspiraling LISA MBHBs*	Zurich
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
07/2024	**15^{th} LISA Symposium** at University College Dublin *Poster: Astrophysical signatures on the LISA data stream from MBHBs*	Dublin
06/2024	**GRAPPA Seminar** at University of Amsterdam *Astrophysical signatures on the LISA data stream from MBHBs*	Amsterdam
06/2024	**LISA community Call** *Measuring eccentricity and gas from GWs of LISA MBHBs*	Online
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 *Astrophysical signatures on the LISA data stream from MBHBs*	Cambridge
09/2023	**Meeting:** LISA Astrophysics Working Group at University of Milano-Bicocca *The minimum measurable eccentricity from GWs of LISA MBHBs*	Milan
09/2023	**Meeting:** The Swiss-Austrian joint Physical Society at University of Basel *The minimum measurable eccentricity from GWs of LISA MBHBs*	Basel
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
07/2023	**Call:** LISA data challenge working group *Measuring eccentricity from GWs of LISA MBHBs*	Online
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 IMBH Binaries*	Toulouse
09/2022	**Conference:** Origin, growth and feedback of black holes in dwarf galaxies Donostia International Physics Center *The imprint of Gas on GWs from LISA IMBH Binaries*	San Sebastian
05/2022	**Conference:** IMBHs: New Science from Stellar Evolution to Cosmology CIERA, Northwestern University *Gas impact on GWs from LISA IMBH Binaries*	San Juan

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

07/2022 | **Workshop:** From Scattering Amplitudes to GW Predictions for Compact Binaries
ETH Zurich & University of Zurich Zurich

06/2022 | **Meeting:** LISA Astrophysics Working Group
Institute for Gravitational Wave Astronomy, University of Birmingham 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 and its astrophysics, waveforms, and data challenge WGs

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 edit it frequently to suit the need of a given project. It provides a complete LISA response and Bayesian inference using ptmcmc sampler.
- Eryn: I have performed reversible jump MCMC with this sampler in lisabeta.
- Mathematica: Frequent user to do analytical approximations and plotting.
- Python: I mainly use this language to edit lisabeta and perform analysis.

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

References

Lucio Mayer
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