Mudit Garg
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Research: ADS Library

Education

08/'21 – 10/'25	Doctor of Philosophy in Gravitational Wave Astrophysics **University of Zurich** Advisor: Prof. Lucio Mayer *Decoding the Sub-Parsec Scale Environment of LISA Massive Black Hole Binaries with Gravitational Waves*
09/'18 – 12/'20	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/'14 – 06/'18	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*

Academic Experience

11/'25 – *10/'27*	Swiss Mobility Postdoctoral Fellow in Astrophysics **New York University** Host: Prof. Andrew MacFadyen

Selected Talks - 6 seminars, 4 invited + 7 contributed conferences, and 7 individual

10/'24	**CTC Theory Seminar** at University of Maryland [25+25 minutes] College Park *Decoding Astrophysics from inspiraling LISA MBHBs*
09/'24	**Astrophysics Seminar** at Johns Hopkins University [45+15 minutes] Baltimore *Decoding Astrophysics from inspiraling LISA MBHBs*
09/'24	**Astro Seminar** at Columbia University NYC *Decoding Astrophysics from inspiraling LISA MBHBs*
06/'24	**GRAPPA Seminar** at University of Amsterdam [45+15 minutes] Amsterdam *Astrophysical signatures on the LISA data stream from MBHBs*
05/'24	**Cosmology Seminar** at Max Planck Institute for Astrophysics Garching *Astrophysical signatures on GWs from LISA MBHBs*
02/'24	**DAMTP GR Seminar** at University of Cambridge [50+10 minutes] Cambridge *Astrophysical signatures on the LISA data stream from MBHBs*
06/'25	**Workshop**: Astrophysical Dynamics: from planets, to stars, to black holes Copenhagen Niels Bohr Institute *Characterizing sub-pc environment of LISA MBHBs*
06/'25	**Conference (Invited)**: DYNAMIX Cambridge Institute of Astronomy, Cambridge *Characterizing sub-pc environment of LISA MBHBs*
05/'25	**Workshop (Invited)**: Gravitational Wave Probes of Black Hole Environments Trieste IFPU, SISSA & ICTP *Characterizing sub-pc environment of LISA MBHBs*
03/'25	**Workshop (Invited)**: Frontiers of Astrophysical Black Holes Sexten Sexten Center for Astrophysics *What solves the 'final parsec' problem for LISA MBHBs?*
08/'24	**Conference (Invited)**: New ideas on the origin of BH mergers Copenhagen Niels Bohr Institute *Astrophysical signatures on the LISA data stream from MBHBs*
11/'24	**Meeting:** LISA Astrophysics Working Group at MPA Garching *What solves the 'final parsec' problem for LISA Massive Black Hole Binaries?*
09/'23	**Meeting:** LISA Astrophysics Working Group at University of Milano-Bicocca Milan *The minimum measurable eccentricity from GWs of LISA MBHBs*

07/'23	**Conference:** GW populations: what's next? at University of Milano-Bicocca *The measurability of gas and eccentricity from GWs of LISA MBHBs*	Milan
11/'22	**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/'22	**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/'22	**Conference:** IMBHs: New Science from Stellar Evolution to Cosmology CIERA, Northwestern University *Gas impact on GWs from LISA IMBHBs*	San Juan
10/'24	**CIERA theory group meeting** at Northwestern University *Decoding Astrophysics from inspiraling LISA MBHBs*	Evanston
09/'24	**Branch Lunch** at NASA Goddard *Decoding Astrophysics from inspiraling LISA MBHBs*	Greenbelt
09/'24	**Astro Coffee** at Institute of Advanced Study *Measuring eccentricity and gas-induced perturbation from GWs of LISA MBHBs*	Princeton
09/'24	**Monday Afternoon Talks** at MIT Kavli Institute *Decoding Astrophysics from inspiraling LISA MBHBs*	Boston
07/'24	**15$^{\text{th}}$ LISA Symposium** at University College Dublin *Poster: Astrophysical signatures on the LISA data stream from MBHBs*	Dublin
	LISA Call	Online
02/'25	Systematics in tests of GR using LISA MBHBs (invited)	Community
06/'24	Measuring eccentricity and gas from GWs of LISA MBHBs	Community
07/'23	Measuring eccentricity from GWs of LISA MBHBs	Data Challenge Working Group

Research visits

06/'25	**Niels Bohr International Academy, University of Copenhagen** *Host: Prof. Johan Samsing*	Copenhagen
10/'24	**Center for Interdisciplinary Exploration and Research in Astrophysics (CIERA)** *Host: Prof. Shane Larson*	Evanston
09/'24	**Center for Computational Astrophysics (CCA), Flatiron Institute** *Host: Prof. Will Farr, Dr. Yan-Fei Jiang, and Dr. Matteo Cantiello*	NYC
02/'24	**Institute of Gravitational Wave Astronomy** *Host: Prof. Alberto Vecchio*	Birmingham
02/'24	**Institute of Cosmology and Gravitation** *Host: Prof. Ian Harry*	Portsmouth
11/'23	**Max Planck Institute for Gravitational Physics (Albert Einstein Institute)** *Host: Dr. Jonathan Gair*	Potsdam

Programs/Schools

07/'25	**MIAPbP Program**: Enabling Future GW Astrophysics in the Milli-Hertz Regime *Munich Institute for Astro-, Particle and BioPhysics*	Garching
09/'24	**Workshop**: Fundamental Physics Meets Waveforms With LISA *Max Planck Institute for Gravitational Physics (Albert Einstein Institute)*	Potsdam
09/'23	**Kavli-Villum School:** Gravitational Waves *Corfu Summer Institute*	Corfu
11/'22	**Workshop:** LISA data analysis: classical methods to machine learning *CNRS, L2IT, APC, CEA, and CNES*	Toulouse

07/'22	**Workshop:** LISA Data Challenge Workshop *LISA Data Challenge Working Group*	Online
01/'22	**Saas-Fee School:** Multi-Messenger GW Astronomy *Swiss Society for Astrophysics and Astronomy*	Saas-Fee
08/'21	**NBIA School:** Gravitational wave astrophysics *Niels Bohr Institute, University of Copenhagen*	Copenhagen

Professional responsibilities and memberships

'25 –	Referee for ApJ
'23 – '25	Organizer of the 'GWs, BHs, and Compact Binaries' seminar *Department of Astrophysics, University of Zurich*
'22 –	Contributor to the LISA DiscIMRI hydrodynamical code comparison project *Tasks: Literature review, plot making, and text writing*
'21 –	Member of the LISA consortium, its astrophysics, waveforms, and data challenge working groups, and its early career scientist group (LECS)
'21 – '25	Teaching assistant for several astrophysics courses at the University of Zurich
'21	Research assistant at the Department of Astrophysics, University of Zurich

Skills

Software and programming language

- GIZMO: Performed and analyzed simulations of gravitational-wave driven LISA massive black hole binaries embedded in accretion disk
- LISABETA: Added several waveform modules. Also, 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
Last update: November 20, 2025