

Mudit Garg

Nationality : Indian

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EDUCATION

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

SELECTED TALKS/PRESENTATIONS

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| 10/2024 | CTC Theory Seminar University of Maryland <i>TBD</i> [†] | College Park |
| 09/2024 | Monday Afternoon Talks MIT Kavli Institute for Astrophysics and Space Research <i>TBD</i> [†] | Boston |
| 09/2024 | Meeting: the Swiss Physical Society meeting ETH Zurich <i>TBD</i> [†] | Zurich |
| 08/2024 | Conference (Invited): New ideas on the origin of black hole mergers Niels Bohr Institute <i>TBD</i> [†] | Copenhagen |
| 07/2024 | 15th LISA Symposium University College Dublin <i>Poster: Astrophysical signatures on the LISA data stream from MBHBs</i> [†] | Dublin |
| 06/2024 | Seminar: GRAPPA University of Amsterdam <i>Astrophysical signatures on the LISA data stream from MBHBs</i> | Amsterdam |
| 06/2024 | Call: LISA community <i>Measuring eccentricity and gas from GWs of LISA MBHBs</i> | Online |
| 05/2024 | Seminar: MPA Cosmology Max Planck institute for Astrophysics <i>Astrophysical signatures on GWs from LISA MBHBs</i> | Garching |
| 02/2024 | Seminar: DAMTP General Relativity University of Cambridge <i>Astrophysical signatures on the LISA data stream from MBHBs</i> | Cambridge |
| 09/2023 | Meeting: LISA Astrophysics Working Group University of Milano-Bicocca <i>The minimum measurable eccentricity from GWs of LISA MBHBs</i> | Milan |
| 09/2023 | Meeting: the Swiss-Austrian joint Physical Society meeting University of Basel <i>The minimum measurable eccentricity from GWs of LISA MBHBs</i> | Basel |
| 07/2023 | Conference: Gravitational-wave populations: what's next? University of Milano-Bicocca <i>The measurability of gas and eccentricity from GWs of LISA MBHBs</i> | Milan |
| 07/2023 | Call: LISA data challenge working group <i>Measuring eccentricity from GWs of LISA MBHBs</i> | Online |
| 11/2022 | Conference: LISA data analysis: from classical methods to machine learning CNRS, L2IT, APC, CEA, and CNES <i>The imprint of Gas on GWs from LISA IMBH Binaries</i> | Toulouse |
| 09/2022 | Conference: Origin, growth and feedback of black holes in dwarf galaxies Donostia International Physics Center <i>The imprint of Gas on GWs from LISA IMBH Binaries</i> | San Sebastian |

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| 05/2022 | Conference: Intermediate-Mass Black Holes: New Science from Stellar Evolution to Cosmology CIERA, Northwestern University <i>Gas impact on GWs from LISA IMBH Binaries</i> | San Juan |
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† Will participate

PUBLICATIONS

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|------|---|------------------------------------|
| 2024 | Accretion mediated spin-eccentricity correlations in LISA massive black hole binaries <i>MG, Christopher Tiede, Daniel J. D'Orazio</i> | Submitted to MNRAS |
| 2024 | Measuring eccentricity and gas-induced perturbation from gravitational waves of LISA massive black hole binaries <i>MG, Andrea Derdzinski, Shubhanshu Tiwari, Jonathan Gair, Lucio Mayer</i> | Submitted to MNRAS |
| 2023 | The minimum measurable eccentricity from gravitational waves of LISA massive black hole binaries <i>MG, Shubhanshu Tiwari, Andrea Derdzinski, John G. Baker, Sylvain Marsat, Lucio Mayer</i> | MNRAS |
| 2022 | The imprint of gas on gravitational waves from LISA intermediate-mass black hole binaries <i>MG, Andrea Derdzinski, Lorenz Zwick, Pedro R. Capelo, Lucio Mayer</i> | MNRAS |
| 2022 | Dirty waveforms: multiband harmonic content of gas-embedded gravitational wave sources <i>Lorenz Zwick, Andrea Derdzinski, MG, Pedro R. Capelo, Lucio Mayer</i> | MNRAS |
| 2020 | Non-linear extension of non-metricity scalar for MOND <i>Fabio D'Ambrosio, MG, Lavinia Heisenberg[‡]</i> | PLB |
| 2020 | ADM formulation and Hamiltonian analysis of Coincident General Relativity <i>Fabio D'Ambrosio, MG, Lavinia Heisenberg, Stefan Zentarra[‡]</i> | arXiv |

‡ Alphabetical order

RESEARCH VISITS

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| 02/2024 | Institute of Gravitational Wave Astronomy <i>Host: Prof. Dr. Alberto Vecchio</i> | Birmingham |
| 02/2024 | Institute of Cosmology and Gravitation <i>Host: Prof. Dr. Ian Harry</i> | Portsmouth |
| 11/2023 | Max Planck institute for Gravitational Physics (Albert Einstein Institute) <i>Host: Dr. Jonathan Gair</i> | Potsdam |

† Will participate

PROGRAMS/SCHOOLS

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|---------|---|------------|
| 09/2024 | Workshop: Fundamental Physics Meets Waveforms With LISA <i>Max Planck institute for Gravitational Physics (Albert Einstein Institute)[†]</i> | Potsdam |
| 09/2023 | Kavli-Villum School: Gravitational Waves <i>Corfu Summer Institute</i> | Corfu |
| 11/2022 | Workshop: LISA data analysis: from classical methods to machine learning <i>CNRS, L2IT, APC, CEA, and CNES</i> | Toulouse |
| 07/2022 | Workshop: LISA Data Challenge Workshop <i>LISA Data Challenge Working Group</i> | Online |
| 07/2022 | Workshop: From Scattering Amplitudes to Gravitational-Wave Predictions for Compact Binaries <i>ETH Zurich & University of Zurich</i> | Zurich |
| 06/2022 | Meeting: LISA Astrophysics Working Group <i>Institute for Gravitational Wave Astronomy, University of Birmingham</i> | Online |
| 01/2022 | Saas-Fee School: Compact-Object Astrophysics in the Era of Multi-Messenger Astronomy <i>Swiss Society for Astrophysics and Astronomy</i> | Saas-Fee |
| 08/2021 | NBIA School: Gravitational wave astrophysics <i>Niels Bohr Institute, University of Copenhagen</i> | Copenhagen |
| 06/2021 | Meeting: LISA Astrophysics Working Group <i>Department of Astrophysics, University of Zurich</i> | Online |

† Will participate

PROFESSIONAL RESPONSIBILITIES AND MEMBERSHIPS

- 2023 – | Organizer of the 'Gravitational Waves, Black Holes, and Compact Binaries' seminar
Department of Astrophysics, University of Zurich
- 2023 – | Contributor to the TianQin white paper about massive black hole binaries and environmental effects
- 2022 – | Contributor to the DiscIMRI code comparison project by the LISA astrophysics working group
- 2021 – | Member of the LISA consortium and its astrophysics, waveforms, and data challenge working groups

SKILLS

Programming Languages: Python | LaTeX

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

Software: Mathematica | lisabeta

Others: PyTorch | Terminal | Git

SELECTED INTERNAL TALKS/PRESENTATIONS

| | Annual PhD seminar | Department of Astrophysics, University of Zurich |
|---------|---|--|
| 03/2024 | Tests of General Relativity using Gravitational Waves | |
| 03/2023 | Bayesed Gravitational Waves: an MCMC story | |
| 02/2022 | The Future of Gravitational Waves | |

ASSISTANCE

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| Spring 2024 | Teaching Assistant for "Computational methods for Radiative Transfer" <i>Helped students during coding exercises</i> | Prof. Dr. Lucio Mayer University of Zurich |
| Fall 2023 | Teaching Assistant for "Introduction to Astrophysics" <i>Viva of students to check understanding</i> | Prof. Dr. Prasenjit Saha University of Zurich |
| Spring 2023 | Teaching Assistant for "Introduction to Astronomy" <i>Prepared exercises and took help classes</i> | Prof. Dr. Aurel Schneider University of Zurich |
| Fall 2022 | Teaching Assistant for "Proseminar in Astrophysics" <i>Helped to prepare presentations and took Viva to check understanding</i> | Prof. Dr. Ravit Helled University of Zurich |
| Spring 2023 | Teaching Assistant for "Universe: Contents, Origin, Evolution and Future" <i>Helped to prepare presentations and took Viva to check understanding</i> | Dr. Pedro R. Capelo University of Zurich |
| Fall 2021 | Teaching Assistant for "Theoretical Astrophysics" <i>Prepared exercises and took help classes</i> | Prof. Dr. Robert Feldmann University of Zurich |
| Spring 2021 | Research Assistant at the Department of Astrophysics <i>Researched on seed black holes and their implications for gravitational waves</i> | Prof. Dr. Lucio Mayer University of Zurich |
| 2019 – 2020 | Research Assistant at D-MTEC <i>Assisted in data compilation, cleanup, analyses</i> | Dr. Yash Raj Shrestha & Zoe Jonassen ETH Zurich |
| Spring 2019 | Course Assistant for "Quantum Field Theory II" <i>Co-wrote the LaTeX script for the course</i> | Prof. Dr. Massimiliano Grazzini University of Zurich |

PRE-DOCTORATE RELEVANT PROJECTS

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| Fall 2020 | GW Data: Constraining deviations from GR and eccentricity in the real GWs data <i>Weak support for non-zero deviations from GR</i> | Dr. Maria Haney University of Zurich |
| Spring 2020 | Machine Learning Course: Mini projects related to regression, feature selection, data imputation, neural networks, and CNN using PyTorch framework | ETH Zurich |
| Fall 2018 | GW Theory: GWs and their propagation in the Λ CDM Universe <i>Including Λ preserves GW's quadrupole nature but slightly modifies its amplitude</i> | Prof. Dr. Philippe Jetzer University of Zurich |

OTHER ACTIVITIES

- **Hobbies and Interests:** Sports, Cooking, Board games, and Hiking

Last update: July 9, 2024