

# Mudit Garg

Nationality : Indian

Date of Birth : 19/01/1996

✉ : [mudit.garg@uzh.ch](mailto:mudit.garg@uzh.ch)

🌐 : [muditgarg96.github.io](https://muditgarg96.github.io)

h-index: 5

## EDUCATION

08/2021 – 07/2025	PhD in Gravitational Waves Astrophysics <b>University of Zurich</b>	Advisor: Prof. Dr. Lucio Mayer
09/2018 – 12/2020	Master of Science in Physics <b>with distinction</b> <b>ETH Zurich</b>	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 <b>Indian Institute of Technology Delhi</b>	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

06/2024	<b>Call:</b> LISA community call <sup>†</sup> <i>TBD</i>	Online
05/2024	<b>Seminar:</b> MPA Cosmology Max Planck institute for Astrophysics <i>Astrophysical signatures on GWs from LISA MBHBs</i>	Garching
02/2024	<b>Seminar:</b> DAMTP General Relativity University of Cambridge <i>Astrophysical signatures on the LISA data stream from MBHBs</i>	Cambridge
09/2023	<b>Meeting:</b> LISA Astrophysics Working Group University of Milano-Bicocca <i>The minimum measurable eccentricity from GWs of LISA MBHBs</i>	Milan
09/2023	<b>Meeting:</b> the Swiss-Austrian joint Physical Society meeting University of Basel <i>The minimum measurable eccentricity from GWs of LISA MBHBs</i>	Basel
07/2023	<b>Conference:</b> 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	<b>Call:</b> LISA data challenge working group <i>Measuring eccentricity from GWs of LISA MBHBs</i>	Online
11/2022	<b>Conference:</b> 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	<b>Conference:</b> 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
05/2022	<b>Conference:</b> 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

† Will participate

## PUBLICATIONS

2024	Accretion mediated spin-eccentricity correlations in LISA massive black hole binaries <b>Mudit Garg, Christopher Tiede, Daniel J. D'Orazio</b>	<a href="#">Submitted to MNRAS</a>
2024	Measuring eccentricity and gas-induced perturbation from gravitational waves of LISA massive black hole binaries <b>Mudit Garg, Andrea Derdzinski, Shubhanshu Tiwari, Jonathan Gair, Lucio Mayer</b>	<a href="#">Submitted to MNRAS</a>
2023	The minimum measurable eccentricity from gravitational waves of LISA massive black hole binaries <b>Mudit Garg, Shubhanshu Tiwari, Andrea Derdzinski, John G. Baker, Sylvain Marsat, Lucio Mayer</b>	<a href="#">MNRAS</a>
2022	The imprint of gas on gravitational waves from LISA intermediate-mass black hole binaries <b>Mudit Garg, Andrea Derdzinski, Lorenz Zwick, Pedro R. Capelo, Lucio Mayer</b>	<a href="#">MNRAS</a>
2022	Dirty waveforms: multiband harmonic content of gas-embedded gravitational wave sources <b>Lorenz Zwick, Andrea Derdzinski, Mudit Garg, Pedro R. Capelo, Lucio Mayer</b>	<a href="#">MNRAS</a>

2020	Non-linear extension of non-metricity scalar for MOND <i>Fabio D'Ambrosio, <b>Mudit Garg</b>, Lavinia Heisenberg<sup>‡</sup></i>	<a href="#">PLB</a>
2020	ADM formulation and Hamiltonian analysis of Coincident General Relativity <i>Fabio D'Ambrosio, <b>Mudit Garg</b>, Lavinia Heisenberg, Stefan Zentarra<sup>‡</sup></i>	<a href="#">arXiv</a>

<sup>‡</sup> Alphabetical order

## RESEARCH VISITS

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

<sup>†</sup> Will participate

## PROGRAMS/SCHOOLS

09/2023	<b>Kavli-Villum School:</b> Gravitational Waves <i>Corfu Summer Institute</i>	Corfu
11/2022	<b>Workshop:</b> LISA data analysis: from classical methods to machine learning <i>CNRS, L2IT, APC, CEA, and CNES</i>	Toulouse
07/2022	<b>Workshop:</b> LISA Data Challenge Workshop <i>LISA Data Challenge Working Group</i>	Online
07/2022	<b>Workshop:</b> From Scattering Amplitudes to Gravitational-Wave Predictions for Compact Binaries <i>ETH Zurich &amp; University of Zurich</i>	Zurich
06/2022	<b>Meeting:</b> LISA Astrophysics Working Group <i>Institute for Gravitational Wave Astronomy, University of Birmingham</i>	Online
01/2022	<b>Saas-Fee School:</b> Compact-Object Astrophysics in the Era of Multi-Messenger Astronomy <i>Swiss Society for Astrophysics and Astronomy</i>	Saas-Fee
08/2021	<b>NBIA School:</b> Gravitational wave astrophysics <i>Niels Bohr Institute, University of Copenhagen</i>	Copenhagen
06/2021	<b>Meeting:</b> LISA Astrophysics Working Group <i>Department of Astrophysics, University of Zurich</i>	Online

<sup>†</sup> Will participate

## PROFESSIONAL RESPONSIBILITIES AND MEMBERSHIPS

2023 –	Organizer of the 'Gravitational Waves, Black Holes, and Compact Binaries' seminar <i>Department of Astrophysics, University of Zurich</i>
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

<b>Programming Languages:</b> Python   LaTeX	<b>Languages:</b> English   German (A1.1)   Hindi
<b>Software:</b> Mathematica   lisabeta	<b>Others:</b> PyTorch   Terminal   Git

## SELECTED INTERNAL TALKS/PRESENTATIONS

03/2023	<b>Annual PhD seminar</b> Bayesed Gravitational Waves: an MCMC story	Department of Astrophysics, University of Zurich
02/2022	The Future of Gravitational Waves	
11/2022	<b>Annual PhD Jamboree</b> Eccentric Binaries in the LISA band	Department of Astrophysics, University of Zurich
11/2021	IMBH Binaries detectable by LISA	

## ASSISTANCE

---

Spring 2024	<b>Teaching Assistant</b> for “Computational methods for Radiative Transfer” <i>Instructor: Prof. Dr. Lucio Mayer</i>	University of Zurich
Fall 2023	<b>Teaching Assistant</b> for “Introduction to Astrophysics” <i>Instructor: Prof. Dr. Prasenjit Saha</i>	University of Zurich
Spring 2023	<b>Teaching Assistant</b> for “Introduction to Astronomy” <i>Instructor: Prof. Dr. Aurel Schneider</i>	University of Zurich
Fall 2022	<b>Teaching Assistant</b> for “Proseminar in Astrophysics” <i>Instructor: Prof. Dr. Ravit Helled</i>	University of Zurich
Spring 2023	<b>Teaching Assistant</b> for “Universe: Contents, Origin, Evolution and Future” <i>Instructor: Prof. Dr. Lucio Mayer &amp; Dr. Pedro R. Capelo</i>	University of Zurich
Fall 2021	<b>Teaching Assistant</b> for “Theoretical Astrophysics” <i>Instructor: Prof. Dr. Robert Feldmann</i>	University of Zurich
Spring 2021	<b>Research Assistant</b> at the Department of Astrophysics <i>Supervisor: Prof. Dr. Lucio Mayer</i>	University of Zurich
2019 – 2020	<b>Research Assistant</b> at the Chair of Strategic Management and Innovation <i>Supervisor: Dr. Yash Raj Shrestha &amp; Zoe Jonassen</i>	ETH Zurich
Spring 2019	<b>Course Assistant</b> for “Quantum Field Theory II” <i>Instructor: Prof. Dr. Massimiliano Grazzini</i>	University of Zurich

## PRE-DOCTORATE RELEVANT PROJECTS

---

04/2020 – 11/2020	<b>GW Data Project:</b> Distinguishing deviations from GR and eccentricity effects in GWs data <i>Supervisor: Dr. Maria Haney</i>	University of Zurich
02/2020 – 06/2020	<b>Machine Learning Course Project:</b> Mini projects related to regression, feature selection, data imputation, neural networks, and CNN using PyTorch framework	ETH Zurich
10/2018 – 01/2019	<b>GW Theory Project:</b> Gravitational waves and their propagation in the $\Lambda$ CDM Universe <i>Supervisor: Prof. Dr. Philippe Jetzer</i>	University of Zurich

## OTHER ACTIVITIES

---

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

Last update: May 8, 2024