

DEVESH GIRI

 DeveshGiri |  deveshgiri |  deveshgiri.github.io |  devesh.giri@students.iiserpune.ac.in

EDUCATION

2021 - Present BS-MS Degree at **Indian Institute of Science Education and Research, Pune, IN**
2021 Class 12th (AISSCE) at **Disha Delphi Public School, Kota, Rajasthan**
2019 Class 10th (ICSE) at **H. P. Children's Academy, Gorakhpur, U.P.**

PUBLICATIONS

D. Giri and B. Gadre, "Understanding SSM-IMRIs with LIGO-Virgo and ET", [in prep.]

PROJECTS/SOFTWARE/CODE RELEASES

playgwtc

[Link to Read the Docs documentation](#)

It is an open-source user-friendly Python command-line tool for fetching, processing, and visualizing data for gravitational-wave events from the Gravitational Wave Open Science Center. This tool allows you to browse GW events through prefix-search, instantly generate high-quality plots, including time-frequency Q-transforms of the raw detector strain data from chosen detectors, and theoretical waveform models based on the event's physical parameters. Installable through pip: [Link to PyPI page](#)

EXPERIENCE

Tata Institute of Fundamental Research, Mumbai, IN

June 2025 - present

Visiting Master's Thesis Student

Guide: [Prof. Suvodip Mukherjee](#)

- Working to model the imprints of primordial black holes (PBHs) on Gravitational Waves (GWs)

IUCAA, Pune, IN and BITS-Pilani, IN

June 2025 - present

Research Internship

Guides: [Prof. Sajal Mukherjee](#), [Dr. Apratim Ganguly](#)

- Study of gravitational waveform systematics for eccentric Intermediate Mass Ratio Inspirals (IMRIs) in the deci-hertz band.

Nikhef, Amsterdam, NL

October 2023 - December 2024

Research Internship

Guide: [Prof. Bhooshan Gadre](#)

- Worked on understanding sub-solar mass black holes (SSM-BHs) intermediate-mass ratio inspirals (IMRIs) in the frequency band of the present and upcoming ground-based GW detectors.
- Showed the detectability of SSM-IMRIs based on (matched-filter) signal-to-noise ratio calculations.
- Performed in-depth fitting factor studies using global optimiser methods (particle swarm optimisation and differential evolution) and Bayesian parameter estimation studies to understand parameter biases/error, waveform systematics and template bank size. Familiarized with IMRPHENOMX and BHPTNRSURROGATE waveform models.
- Demonstrated the significant effects of higher harmonics for IMRI systems and need to develop aligned and precessing spin waveform surrogates.

Vanderbilt University, Nashville, USA

May 2023 - July 2023

Summer Internship

Guide: [Prof. Karan Jani](#)

- Completed PyCBC tutorials and familiarized with using PyCBC Inference and Bilby for bayesian parameter estimation.

- Worked on studying the improvement in parameter estimates by including LIGO-India in the detector network.
- Demonstrated 30% – 90% improvements in different parameters through bayesian parameter estimation for GW190521-like systems.

SCHOOLS/LECTURES/COURSES

CIERA, Northwestern University, IL, USA (online)

August 2025

Code/Astro 2025 *A Software Engineering Workshop for Astronomy*

Guides: [Dr. Jason Wang](#), [Dr. Sarah Blunt](#)

- Hands-on tutorials and lectures on Development Environments, Programming Paradigms, `Git` Mechanics, Debugging, Parallel Programming, `jax`, Releasing Code, Code Documentation, Software Testing, Anti-Discriminatory Practices, and Code Profiling.
- As a part of the workshop project, released an open-source (pip installable) software `playgwtc` with command-line tools for fetching, processing, and visualizing data for gravitational-wave events from the Gravitational Wave Open Science Center.

International Centre for Theoretical Sciences - TIFR, Bengaluru, IN

July 2025

GW Summer School Guides: [Dr. Surhud More](#), [Dr. Chiara Caprini](#), [Dr. Tirthankar Roy Choudhury](#)

- Undertook three courses: Probing the early universe using GW observations; Cosmography using GW standard sirens; and, Probing large-scale structure using GW observations
- Besides the rigorous theoretical lectures, gained practical experience in GW Population Analysis, Cosmological Parameter Inference and N-Body Cosmological Simulations. Hands-on experience with different softwares/codes used for such studies: `GWCOSMO`, `ICAROGW` and `GADGET-4`
- Delivered a flash talk and presented a poster on SSM-IMRIs.

National Centre for Radio Astrophysics - TIFR, Pune, IN

May 2022 - August 2022

CCS Lectures

Guides: [Prof. Yashwant Gupta](#), [Prof. Ruta Kale](#), [Prof. Yogesh Wadadekar](#)

- An overview of multi-wavelength astronomy (with qualitative descriptions of astrophysical objects), mechanism of radio telescopes and GMRT.
- Learned to work with FITS files and about mean and median stacking with some optimising techniques like the Binapprox algorithm.
- An exposure of equatorial/Galactic coordinates.
- An exposure of Astronomy Catalogues. Worked with AT20G BSS catalogue and SuperCOSMOS all-sky catalogue to learn about cross-matching.
- Learned about optimisation and used NumPy optimisation, Sorting optimisation and Binary search optimisation.
- Learned about k-d trees optimisation using Astropy

The University of Sydney, Australia (Coursera)

Data-driven Astronomy

Guides: [Prof. Tara Murphy](#), [Dr. Simon Murphy](#)

- Course conducted by Dr. Tara Murphy and Dr. Simon Murphy, focussing on working with large datasets, implementing algorithms, and learning from data using ML tools. I will be learning to work with files from exoplanet surveys, pulsar detections, galaxy clusters, etc., using Python and SQL.

SKILLS

Programming languages and softwares

Python, Bash, Git, \LaTeX , MATLAB, PyCBC, GW-COSMO, ICAROGW, GADGET-4

Operating systems

macOS, Linux, Windows

Cluster computing

HTCondor

PRESENTATIONS/TALKS/SEMINARS

33rd IAGRG Conference

January'25, 02 - January'25, 04

Poster presentation

- Presented a poster on GWs from SSM-IMRIs and displayed some of the results from the research carried during the internship at Nikhef.

WORKSHOPS

Workshop on Gravitational Waves and LIGO-India

October 2024

BITS, Pilani

Gravitational Wave Open Data Workshop

April 2024

gwosc.org and *IUCAA*

Workshop on Data Science in Astronomy

December 2023

IUCAA

VOLUNTEER EXPERIENCE

Core Member and Tutor

August 2022 - April 2023

Mindspark, DISHA

IISER, Pune, IN

- Mindspark, DISHA is an initiative by the students of IISER-Pune which imparts education to underprivileged students of Grade 8 by conducting classes every Saturday and Sunday. I worked to design the structure of Mathematics lectures and also volunteered for weekly lectures as a tutor.