

ML4HEP

4th Machine Learning for High Energy Physics School

High Energy Physics is a domain of knowledge that looks for tiny signals of new physics in multi-petabyte-scale data. After the discovery of the Higgs boson during the past decade, Machine Learning (ML) techniques have percolated all domains of particle physics with a rapid rise in the number of new ideas and publications. Similar data-intensive challenges also arise in astroparticle physics, where large-scale observatories detect rare cosmic messengers such as neutrinos, gamma rays, and cosmic rays to probe astrophysical phenomena in the universe. In the last decade, all the techniques at the frontier of ML, like graph neural networks (GNN), topological networks, physics-informed neural networks (PINN), Pareto conditioned network (PCN) and quantum informed neural networks (QINN), are completely changing the way we look at data.

The ML4HEP (Machine Learning for High Energy Physics) school series is an initiative focused on statistical methods and advanced machine-learning applications in HEP and astroparticle physics, though the concepts and algorithms used are general enough to be applicable in other domains of the natural sciences. The series began at ICTS Bengaluru in 2023, followed by editions at IOP Bhubaneswar in 2024 and IISER Kolkata in 2025. These schools have provided a stimulating environment for PhD students, postdocs, and young researchers from India with a strong emphasis on hands-on training in tools such as Python, ROOT, Keras/TensorFlow, PyTorch, and modern ML methods, including CNNs, RNNs, GANs, GNNs, diffusion models, transformers, differentiable programming and more.

Academic Organizing Committee

Satyaki Bhattacharya, SINP, Kolkata
Rajdeep M. Chatterjee, TIFR, Mumbai
Sanmay Ganguly, IIT Kanpur
Shilpi Jain, TIFR, Mumbai
Partha Konar, PRL, Ahmedabad
Pratik Majumdar, SINP, Kolkata
Aruna K Nayak, IOP, Bhubaneswar
Atreyee Sinha, TIFR, Mumbai
Raghunath Sahoo, IIT Indore
Ritesh K Singh, IISER, Kolkata

Local Organizing Committee

Rajdeep M. Chatterjee, TIFR, Mumbai
Shilpi Jain, TIFR, Mumbai (Convener)
Mohamed Rameez, TIFR, Mumbai
Tuhin S. Roy, TIFR, Mumbai
Atreyee Sinha, TIFR, Mumbai

Pre-School (online)

May 11 - 29, 2026

Main School & Workshop (offline)

June 29 - July 11, 2026

Venue for the Main School

Tata Institute of Fundamental Research
Main campus, Mumbai

Program Link

<https://tifr.link/ml4hep>

Contact Us

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