IOP Joint APP and HEPP Annual Conference 2026

Wednesday, 8 April 2026 - Friday, 10 April 2026

Scientific Programme

Accelerator Innovations

Explore the latest advancements in accelerator technologies, focusing on novel designs, operational upgrades, and emerging applications. This track will cover energy efficiency, precision beam control, and future accelerator concepts, such as linear colliders and plasma wakefield accelerators, critical for the next generation of particle physics experiments.

Detectors and Instrumentation

Highlighting innovations in detector technologies and instrumentation, this track covers advancements in sensor materials, electronics, data acquisition systems, and radiation hardness. Discussions will emphasise how these developments enable groundbreaking physics measurements across diverse experimental platforms.

Collider Physics - Flavour

Dedicated to the study of flavour physics at colliders, this track examines the production and decay of heavy-flavour particles, CP violation, and rare processes. Topics include results from experiments and the implications of flavour anomalies for physics beyond the Standard Model.

Collider Physics - Electroweak (EW) and Higgs

Focusing on electroweak physics and Higgs boson studies, this track explores precision measurements, Higgs properties, and searches for deviations from Standard Model predictions. Discussions include cross-section measurements, rare decays, and their role in understanding the fundamental forces.

Collider Physics - QCD

This track is dedicated to QCD in the high-energy regime, focusing on parton distributions, hadronisation, jet physics, strong dynamics, and lattice calculations.

Precision and Anomalies

Highlighting precision measurements and current anomalies, this track examines their implications for fundamental physics. Topics include precision tests of the Standard Model, muon g-2, data-driven approaches and the lattice, rare decays, and tensions in existing experimental results.

Beyond the Standard Model

This track will cover theoretical and experimental efforts to uncover new physics beyond the Standard Model. Discussions include searches for supersymmetry, axions, extra dimensions, and other exotic phenomena at both colliders and non-collider experiments.

Terrestrial Dark Matter Searches

Focused on the hunt for dark matter, this track covers laboratory-based experiments such as direct detection using low-threshold detectors, axion searches, and complementary indirect detection techniques.

Neutrino Physics

This track explores the cutting-edge of neutrino research, including oscillation experiments, neutrino-nucleus scattering, sterile neutrino searches, and neutrino mass constraints. Experimental and theoretical insights into extraterrestrial neutrino sources will also be discussed, including the role of neutrinos in the early universe.

Cosmic Messengers

Examining cosmic rays, gamma rays, neutrinos, and gravitational waves, this track focuses on the interplay between particle physics and astrophysics. Discussions will highlight multimessenger astronomy, cosmic origins, and the latest results from observatories and satellite experiments.

Theory Frontiers

Dedicated to advancing theoretical frameworks, this track addresses the connection between fundamental laws and experimental observations. Topics include quantum and lattice field theory, the interplay of particle physics and cosmology, and innovative approaches to unsolved questions in the Standard Model.

Analysis and Reconstruction Methods

This track focuses on the methodologies and techniques used to analyse and reconstruct data in particle physics experiments. Topics include advanced statistical methods, event reconstruction algorithms, simulation techniques, and tools for extracting physical observables.

EDIA, Outreach, and Sustainability

This track emphasises the importance of equity, diversity, inclusion, and accessibility in fostering a vibrant research community. It also addresses strategies for sustainable practices in experimental setups and outreach efforts to engage the broader public in the excitement of high-energy particle physics and astroparticle physics.

Applications

Explore the application of particle and astroparticle technologies (including detectors, DAQ, ultra□low□background techniques, and advanced reconstruction/AI) to real□world challenges, with a particular focus on applications to medical technology.

We welcome results from novel hardware or materials, algorithms, clinical evaluations, and case studies of technology transfer.