

Session Program

24-28 Aug 2026



EUROPEAN COALITION FOR AI
IN FUNDAMENTAL PHYSICS
CONFERENCE
EuCAIFCon 2026

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Simulations & Generative Models

Kirchhoff Institute for Physics (KIP), Foyer
Im Neuenheimer Feld 227 69120 Heidelberg Germany

Monday 24 August

16:00

Simulations & Generative Models

Session | **Location:** HS2 | **Convener:** Andreas Ipp

16:00–16:08

Generative Machine Learning for Fast Calorimeter Simulation in ATLAS

Speaker

Florian Ernst

16:10–16:18

AllShowers: One model for all calorimeter showers

Speaker

Thorsten Buss

16:20–16:28

Cross-Geometry Shower Simulation via Pre-training and Transfer

Speaker

Lorenzo Valente

16:30–16:38

Experts or Generalists in Calorimeter Simulation

Speaker

Henry Day-Hall

16:50–16:58

Parnassus: Fast and Accessible Realistic Full Event Simulation

Speaker

Dmitrii Kobylanskii

17:00–17:08

Speeding up the MC Background Simulation at Belle II

Speaker

Oliver Schumann

17:10–17:18

To surrogate or to differentiate? A Delphes3 optimization study

Speaker

Luigi Favaro

17:30

Tuesday 25 August

11:00

Simulations & Generative Models

Session | **Location:** HS2 | **Convener:** Marco Letizia

11:00–11:08

Generative diffusion models for non-abelian gauge theories on the lattice

Speaker

Gert Aarts

11:10–11:18

Diffusion Models for SU(2) Lattice Gauge Theory in Two Dimensions

Speaker

Bao-Dong Sun

11:20–11:28

Improved Lattice Simulations from Machine-Learned Gauge Actions

Speaker

Andreas Ipp

11:30–11:38

Generative AI for Extreme QCD Matter: from lattice path integrals to fast heavy-ion event generation

Speaker

Prof. Kai Zhou

11:50–11:58

Normalising Flow-Assisted Neural Quantum States for Ground-State Estimation

Speaker

Timur Sypchenko

12:00–12:08

Reconstruction of Gravitational Form Factors using Generative Machine Learning

Speaker

Iuliia Panteleeva

12:10–12:18

Sampling with physics-informed kernels

Speaker

Jan Pawłowski

12:20–12:28

Physics-informed kernels: Utilising stochastic processes for complex problems

Speaker

Renzo Kapust

12:30

Wednesday 26 August

14:00

Simulations & Generative Models

Session | **Location:** HS2 | **Convener:** Andre Scaffidi

14:00–14:08

Developing Physics-based Gaussian Process Method for Sample-Efficient Inference in Particle Accelerators

Speaker

Victoria Isensee

14:10–14:18

RHINE: R-process Heating Implementation in hydrodynamic simulations with NEural networks

Speaker

Zewei Xiong

14:20–14:28

Machine-learning surrogate modeling of redshift observables in matter-perturbed black hole spacetimes

Speaker

Ariadna Uxue Palomino Ylla

14:30–14:38

Field-Level Diffusion Surrogates for Reionization Astrophysics and Cosmology

Speaker

Divesh Jain

14:50–14:58

An invertible simulator for efficient reconstruction of dark matter density from line intensity maps

Speaker

Thomas Blankenburg

15:00–15:08

Neural Operator Architectures for the 21cm Reionization Field: Fourier and Beyond

Speaker

Haris Kapetanovic

15:10–15:18

A compact flow-matching surrogate for gravitational waveforms

Speaker

Waleed Esmail

15:20–15:28

Machine Learning Approaches to Black Hole Dynamics: From Perturbation Theory to Numerical Relativity

Speaker

Xisco Jimenez Forteza

15:30

Thursday 27 August

11:00

Simulations & Generative Models

Session | **Location:** HS2 | **Convener:** Andrew Pilkington

11:00–11:08 **MadNIS at NLO**

Speaker

Giovanni De Crescenzo

11:10–11:18 **Neural Control Variates for LO and NLO**

Speaker

Sophia Vent

11:20–11:28

Billion-Event Generation for Complete Partonic Many-Jet Processes: An End-to-End GPU Workflow with Normalizing Flows

Speaker

Daohan Wang

11:40–11:48 **Generative Amplification with Surrogate Monte Carlo**

Speaker

Rebecca Revelli

11:50–11:58 **FASTColor - Full-color Amplitude Surrogate Toolkit for QCD**

Speaker

Javier Mariño Villadamigo

12:00–12:08

Estimating event-by-event multiplicity by a Machine Learning Method for Hadronization Studies

Speaker

Gergely Gábor Barnaföldi

12:30