

Session Program

14-18 Sept 2026



ML4Jets 2026

Parallel Talks

Monday 14 September

11:00

Parallel Talks

Session

11:00–11:20

b-hive: a CMS wide Machine Learning Framework

Speaker

Ulrich Willemsen

11:20–11:40

Machine Learning Tools for JetMET Data Certification in CMS

Speaker

Jawaher Altork

11:40–12:00

Improving particle identification in the Belle II TOP detector using machine learning

Speaker

Cecilia Antonioli

12:00

11:00

Parallel Talks: Uncertainty Quantification

Session

11:00–11:20

Model Uncertainty in the Measurement of the Gluon-Jet Fraction

Speaker

Siarhei Shulha

11:20–11:40

Local Conformal Predictions for Calibrated Surrogates

Speaker

Suprio Dubey

11:40–12:00

Know What You Don't Flow

Speaker

Lorenz Vogel

12:00

13:30

Parallel Talks: Jet Tagging

Session

13:30–13:50

Transforming Flavour Tagging with the ATLAS Detector: ML tools and calibration techniques for small-R jets and boosted objects

Speaker

Alexander Gavin

13:50–14:10

Deep Learning Methods for Jet Tagging and Process Classification Using Image Processing

Speaker

Jhoão Gabriel Martins Campos de Almeida Arneiro

14:10–14:30

An ML-based 4-prong Tagger for hadronic decays of highly boosted heavy scalars in ATLAS**Speaker**

Jae Jin Hong

14:30–14:50

AI for Rare Top-Higgs Processes at the LHC**Speaker**

Dr Adil Jueid

14:50–15:10

Simplex Demixing: Disentangling Multiple Light-Flavor Jets at Colliders**Speaker**

Gregorio de la Fuente Simarro

15:10–15:30

"Hadron-in-fat-jet" AI Tagging to Detect Rare Decays**Speakers**

Mr Linrui Chen, Qiang Li, Mr Zixun Kou

15:30

13:30

Parallel Talks: Phenomenology**Session**

13:30–13:50

Mass-unspecific classifiers for mass-dependent searches**Speaker**

SERGIO RODRIGUEZ BENITEZ

13:50–14:10

A Machine-Learning Analysis of the Higgs Boson in the $H \rightarrow ZZ^* \rightarrow 4l$ Channel**Speaker**

Mane Papoyan

14:10–14:30

Hunting the Unseen: Parameter-Agnostic Deep Learning for Semi Visible Jet Tagging**Speaker**

Mr Miguel Angel Avendano Bernal

14:30–14:50

Understanding the Performance Gains of a full-event $HH \rightarrow 4b$ Search**Speaker**

Yipin Wang

14:50–15:10

Enhancing the Sensitivity for Triple Higgs Boson Searches with Deep Learning Techniques**Speaker**

Feng-Yang Hsieh

15:10–15:30

Measurement of the Energy Dependence of Strong Isospin Violation in $\Upsilon(4S)$ Decays Using a Neural Network Event Classifier**Speaker**

Lena Nowatzki

15:30

16:00

Parallel Talks: Jet Tagging

Session

16:00–16:20

Instance-Level b-Hadron Tagging with DELPHI Open Data

Speaker

Sitian Qian

16:20–16:40

Domain Adaptation in Colliders: Reconcile Simulation and Data

Speaker

Shang-Fu Wei

16:40–17:00

Classifying hadronic objects in ATLAS with machine learning

Speaker

Robert Les

17:00–17:20

PanopTag: Simultaneously Tagging All Jets in a Particle Collision Event

Speaker

Umar Sohail Qureshi

17:20–17:40

Physics Aware Modifications to Particle Transformers (Mod-ParT) for Jet Tagging

Speaker

Mr Osman Bayraktar

17:40–18:00

Multiclass classification without labels (multiCWoLa)

Speaker

Johann Michael Ioannou-Nikolaides

18:00

16:00

Parallel Talks: Reinterpretation & Theory

Session

16:00–16:20

Clustering for large-scale reinterpretation of new physics searches at the LHC

Speaker

Judita Mamuzic

16:20–16:40

Open library of learned likelihoods from LHC experiments

Speaker

Humberto Reyes-Gonzalez

16:40–17:00

Learning to bin: differentiable approach for multi-dimensional discriminants in high-energy physics

Speaker

Nitish Kumar Kasaraguppe Veerappa Gowda

17:00–17:20

Resummed Distribution Functions: Making Perturbation Theory Positive and Normalized

Speaker

Radha Mastandrea

17:20–17:40

Theory-informed neural networks for particle physics

Speaker

Barry Dillon

17:40–18:00

Scaling Particle-Level Foundation Models on Real Heavy-Ion Collision Data

Speaker

João A. Gonçalves

18:00

Tuesday 15 September

11:00

Parallel Talks: Generative Models

Session

11:00–11:20

Generative Amplification with Surrogate Monte Carlo

Speaker

Rebecca Revelli

11:20–11:40

Forecasting Generative Amplification

Speaker

Sascha Cassandra Diefenbacher

11:40–12:00

Neural Control Variates for LO and NLO

Speaker

Sophia Vent

12:00

11:00

Parallel Talks: Reconstruction / Calibration

Session

11:00–11:20

Amber: Self-Attention Muon Track Reconstruction in JUNO

Speaker

Xiaoying Lu

11:20–11:40

Learning pairwise associations for event slicing in ProtoDUNE-SP

Speaker

Christina Karagianni

11:40–12:00

Optimizing Optimal Transport-based Pileup Mitigation

Speaker

Nathan Suri Jr.

12:00

13:30

Parallel Talks: Generative Models

Session | Convener: Sascha Cassandra Diefenbacher

13:30–13:50

Efficient Event Generation for High-Multiplicity LHC Processes: An End-to-End GPU Workflow with Normalizing Flows

Speaker

Daohan Wang

13:50–14:10

Too good to go: Upcycling Phase-Space Points for Multijet Processes

Speaker

Konrad Helms

14:10–14:30

MadNIS at NLO

Speaker

Giovanni De Crescenzo

14:30–14:50

Sampling NNLO QCD phase space with normalizing flows**Speaker**

Timo Janßen

14:50–15:10

Re-Ranking the CaloChallenge 2022**Speaker**

Agni Purani

15:10–15:30

FastSimu: Constraint-Preserving Generative Fast Simulation of Optical-Photon Response at Wavelength-Shifting-Fiber Entry**Speaker**

Mr Jiacheng Wu

15:30

13:30

Parallel Talks: Reconstruction / Calibration**Session**

13:30–13:50

Learning to Reconstruct Muon Detector Showers from Raw Detector Readout**Speaker**

Asu Guvenli

13:50–14:10

Probabilistic, Structure-Intrinsic Clustering with an Hierarchical Embedding (PSICHE) in Time and Space Applied In Particle Physics Jet Reconstruction**Speaker**

Margaret Rose Lazarovits

14:10–14:30

Transformer-based machine learning using low-level calorimeter signals for collimated photon identification**Speaker**

Gabriel Matos

14:30–14:50

Transformer-based reconstruction of electromagnetic showers in CMS**Speaker**

Yuliia Maidannyk

14:50–15:10

Reconstruction of Tracker Material with Information Field Theory**Speaker**

Alexander Pesch Berrocal

15:10–15:30

Curvature-Adaptive Graph Neural Networks for Low-pT Charged-Particle Track Reconstruction at the HL-LHC**Speaker**

Mr Syed Haider Ali

15:30

16:00

Parallel Talks: Generative Models**Session**

16:00–16:20

Toward Complete ML-Based Simulation for CMS with FlashSim**Speaker**

Prabhat Solanki

16:20–16:40

To surrogate or to differentiate? A Delphes3 optimization study**Speaker**

Luigi Favaro

16:40–17:00

Parnassus for Detector Simulation with Legacy e^+e^- Collider Data**Speaker**

Ya-Feng Lo

17:00

16:00

Parallel Talks: Reconstruction / Calibration**Session**

16:00–16:20

Graph Neural Networks for Calorimeter-Based Cluster Calibration at the ATLAS Experiment**Speaker**

Matthew Green

16:20–16:40

Calibration of signatures from simulated electromagnetic showers in the CMS calorimeter with machine learning**Speaker**

Caio Cesar Daumann

16:40–17:00

Latest machine learning techniques for reconstructing and calibrating hadronic objects in ATLAS**Speaker**

Matthew Green

17:00

Wednesday 16 September

10:30

Parallel Talks: Fast Simulation Session

10:30–10:50 **Simulating the CMS High-Granularity Calorimeter with Generative AI**

Speaker

Sitian Qian

10:50–11:10 **Fast Calorimeter Simulation in ATLAS with Modern Generative Models**

Speaker

Florian Ernst

11:10–11:30 **AllShowers: One model for all calorimeter showers**

Speaker

Thorsten Buss

11:30–11:50 **Fast Point Cloud Generation via Latent Diffusion**

Speaker

Martina Mozzanica

11:50–12:10

step2point: Optimising Point Cloud Representations for Fast Calorimeter Simulation

Speaker

Peter McKeown

12:30

10:30

Parallel Talks: Foundation Models Session

10:30–10:50 **LI-JEPA: Self-supervised pretraining of Lorentz Invariant Models**

Speaker

Andreas Hermansen

10:50–11:10

To Mask, Predict, or Classify? Comparative Analysis of Pre-Training Strategies for Jet Foundation Models

Speaker

Anuranjan Sarkar

11:10–11:30

Performance of Tabular Foundation Models for analysis of 4-vectors LHC final states with the FAIR Universe HiggsML Dataset

Speaker

David Rousseau

11:30–11:50

What can representation geometry reveal about collider foundation models? Towards Scientific AI as a New Microscope

12:30

14:00

16:00

Speaker

Tianji Cai

11:50–12:10

Scaling tokenized models for full-event generation**Speaker**

Dan Godi

12:10–12:30

Top quark spin and CP studies with L-GATr**Speaker**

Marco Menen

Parallel Talks: Fast Simulation / Explainable AI**Session**

14:00–14:20

SPADE: Split-and-Delay Embeddings for Autoregressive High-Granularity Calorimeter Simulation**Speaker**

Henning Rose

14:20–14:40

Improving neural generative models with density estimation and Monte-Carlo resampling**Speaker**

Dr Minh Tuan Pham

14:40–15:00

Information Geometry of Learned Latent Representations**Speaker**

Rebecca Maria Wolfgramm-Kuntz

15:00–15:20

Information Geometry of Latent Representations for Interpretable Jet Tagging**Speaker**

Benedikt Schosser

15:20–15:40

Where Does the Particle Transformer Look Inside a Jet? A Jacobian-Lens Interpretation**Speaker**

Sitian Qian

15:40–16:00

Do Jet Taggers Learn Physics? Probing and Steering Latent Directions in a Transformer Tagger**Speaker**

Daniel Tiourine

14:00

Parallel Talks: Foundation Models / Agentic Workflows

Session

14:00–14:20

Measurement of Spin and Quantum Correlations in $Z \rightarrow \tau^+ \tau^-$ Decays at LEP with DELPHI**Speaker**

Mr Chen-Hua Hsu

14:20–14:40

Preference-Optimized Generative Models for Underconstrained Inference in Particle Physics**Speaker**

Mr Ting-Hsiang Hsu

14:40–15:00

Searching For Anomalies with Foundation Models**Speaker**

Vinicius Massami Mikuni

15:00–15:20

Foundation Models for Jet Anomaly Detection: Optimization and Generalization**Speaker**

Soumya Shaw

15:20–15:40

Agentic AI for Automated Foundation Model Analysis in HEP**Speaker**

Yue Xu

15:40–16:00

ColliderBench: Benchmarking AI Agents with Particle Physics Analysis Reproduction**Speaker**

Sofia Palacios Schweitzer

16:00

16:30

Parallel Talks: Agentic Workflows

Session

16:30–16:50

MadAgents**Speaker**

Daniel Schiller

16:50–17:10

Agentic AI applications to particle theory and collider phenomenology**Speaker**

Konstantin Matchev

17:10–17:30

Ariadne: Agentic Automation of Collider-Physics Workflows**Speaker**

Aman Upadhyay

17:30–17:50

Agentic Re-Casting using Agentic Re-Simulations

18:10

Speaker

Nikita Schmal

17:50–18:10

Optimizing local LLM agents for HEP**Speaker**

Darius Faroughy

16:30

Parallel Talks: Explainable AI**Session**

16:30–16:50

Autoencoders for Symbolic Distillation of Black-Boxes**Speaker**

Alan Gu

16:50–17:10

Jet Taggers Rediscover the Energy Correlators: A Causal and Explainable-AI Dissection**Speaker**

Sanmay Ganguly

17:10–17:30

A Unified Geometric Framework for Understanding Collider Event Manifolds**Speaker**

Hancheng Li

17:30–17:50

Interpreting Parton Distributions with Shapley Values**Speaker**

Raphael Bonnet Guerrini

17:50–18:10

Data driven hadronization with HOMER**Speaker**

Susie Kim

18:10

Thursday 17 September

10:30

Parallel Talks: Anomaly Detection

Session | Convener: Barry Dillon

10:30–10:50

Getting More Power from Anomaly Detectors for Free with Weights

Speaker

Rikab Gambhir

10:50–11:10

Improving direct background estimation for resonant anomaly detection

Speaker

Mark Fanselow

11:10–11:30

Kitchen Sink Anomaly Detection

Speaker

Lukas Lang

11:30–11:50

Anomaly detection with normalizing flows for model-agnostic new physics searches

Speaker

Rafal Maselek

11:50–12:10

Unsupervised Machine Learning for Jet-Based Anomaly Detection in ATLAS

Speakers

Antonio D'Avanzo, Elvira Rossi, Francesco Ciotto, Francesco Conventi, Graziella Russo

12:10–12:30

Look Everywhere Effects in Anomaly Detection

Speaker

Marie Hein

12:30

10:30

Parallel Talks: Fast AI / Trigger

Session

10:30–10:50

ORBIT: Online Real-time Bandwidth reduction via Information Tokens

Speakers

Philipp Wagner, Younes Malek Elberkennou

10:50–11:10

Machine learning for jets for the CMS Phase-2 Update of the L1 Trigger

Speaker

Stella Felice Schaefer

11:10–11:30

Do BitNet Gains Survive FPGA Synthesis? An Implementation-Aware Benchmark of Low-Precision Jet Classification

Speaker

Dorian Slood

11:30–11:50

High-performance and portable ML Inference using SOFIE**Speaker**

Sanjiban Sengupta

11:50–12:10

FlashJet: exact jet clustering and jet substructure reconstruction at the GPU era**Speaker**

Chirayu Gupta

12:10–12:30

Application of Machine Learning to Collision Parameter Tuning in the SuperKEKB Accelerator**Speaker**

Riku Takizawa

12:30

14:00

Parallel Talks: Anomaly Detection**Session**

14:00–14:20

Domain Adaptation Against Background Sculpting**Speaker**

Vincent Benne

14:20–14:40

HAXAD: Anomaly Detection in the Higgs Peak**Speaker**

Dennis Noll

14:40–15:00

Recent Results from Anomaly Detection Searches on CMS**Speaker**

Tore Von Schwartz

15:00–15:20

Towards a Statistical Interpretation of the Normalized Autoencoder**Speaker**

Jonathan Ostertag-Henning

15:20–15:40

Detecting and Adapting to Distribution Shift in Real-Time Anomaly Triggers**Speaker**

Amishi Agrawal

15:40–16:00

Multitask, Every Region, All at Once : Fine-Tunable Region-Conditioned Simulation-Based Inference for Collider Analysis**Speaker**

Yong Sheng Koay

16:00

14:00

Parallel Talks: Simulation Based Inference**Session**

14:00–14:20

Proton Structure from Neural Simulation-Based Inference at the LHC

Speaker

Jaco ter Hoeve

14:20–14:40

Reliable Likelihood Ratios for Neural Simulation Based Inference in HEP**Speaker**

Nino Kovacic

14:40–15:00

Iterative Simulation-Based Inference for the LHC**Speaker**

Ranit Das

15:00–15:20

Probing the Higgs Charge Parity at the LHC with Invertible Neural Networks**Speaker**

Nityaansh Parekh

15:20–15:40

Trusting Generative Unfolding**Speaker**

Sebastian Pitz

15:40–16:00

Unfolding without Iterations, Adversaries, or Surrogates**Speaker**

Ayodele Ore

16:00

16:30

Parallel Talks: Scaling Laws**Session**

16:30–16:50

Scaling laws for amplitude surrogates**Speaker**

Joaquin Iturriza Ramirez

16:50–17:10

Neural Scaling Laws for Jet Generation**Speaker**

Anna Kindsvater

17:10–17:30

Scaling Laws for the Unified Particle Transformer in Heavy-Flavour Tagging**Speaker**

Pavlo Kashko

17:30

16:30

Parallel Talks: Simulation Based Inference**Session**

16:30–16:50

A fully-differential charged particle phase space measurement of $Z\gamma$ production in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector**Speaker**

Kevin Thomas Greif

16:50–17:10

Learning the latent structure of background distributions

Speaker

Santiago Tanco

17:10–17:30

Exploring data-driven likelihood estimation with normalizing flows for CRESST

Speaker

Danae Danielle Valdenaire

17:30

Friday 18 September

10:30

Parallel Talks: Equivariant NN

Session

10:30–10:50

Virtues and Vices of Equivariant Transformers

Speaker

Jonas Spinner

10:50–11:10

Economical Jet Taggers -- Equivariant, Slim and Quantized

Speaker

Antoine Petitjean

11:10–11:30

Group equivariance in infrared and collinear safe graph neural networks for jet classification

Speaker

Vishal Singh Ngairangbam

11:30–11:50

Enforcing IRC Safety and Lipschitz-Constrained Insensitivity to Non-Perturbative Effects in Transformers

Speaker

Umar Sohail Qureshi

11:50–12:10

One Generator, Any Process: LLM-Conditioning for the LHC

Speaker

Thanush Sivagnanalingam

12:30

10:30

Parallel Talks: Quantum Machine Learning

Session

10:30–10:50

Neural-network quantum states for exotic hadrons and nuclei

Speaker

weilin wu

10:50–11:10

(ZOOM) Variational Quantum Classification Heads for Particle Transformer-Based in Jet Tagging

Speaker

Nadia Sharna

11:10–11:30

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

Speaker

Timur Sypchenko

11:30–11:50

Continuous-Variable Photonic Quantum Machine Learning for High-Energy Physics: The 1-Particle 1-Qumode Framework**Speaker**

Louis Choron

11:50–12:10

Information-theoretic and quantum-informed approaches for jets at the LHC**Speaker**

Aritra Bal

12:10–12:30

Lund Plane to Bloch (LP2B) encoding for object and polarization tagging with quantum jet substructure**Speaker**

Luca Della Penna

12:30

14:00

Parallel Talks**Session**

14:00–14:20

4D Particle Tracking in the NA62 GigaTracker with Transformer-Based Architectures**Speaker**

Gemma Tinti

15:00

14:00

Parallel Talks: Large Language Models**Session**

14:00–14:20

Fine-tuning Small Language Models for Particle-Physics Lagrangian Generation**Speaker**

Paul Schmidt

14:20–14:40

Classification-Generative Supervised Fine-Tuning for Hierarchical Tagging of ML4HEP Literature**Speaker**

Ziyue Chen

14:40–15:00

Steering in Theory Space: Representation Engineering of a Lagrangian Transformer**Speaker**

Yong Sheng Koay

15:00