UQ4ML | COMETA Workshop on Uncertainty Quantification and Machine Learning

Monday 15 September 2025 - Thursday 18 September 2025

CEA Paris-Saclay

Scientific Programme

Uncertainty quantification (UQ) is a vast field of research which has received the attention of mathematicians and physicists alike. UQ goes beyond acknowledging the **limitations** of models and data: it enables the constructions of **trustworthy** and **reliable** predictive models, key components of many real-world applications.

UQ4ML is the meeting point of different research directions, from applied mathematics and statistics to theoretical and experimental physics. We shall discuss recent advancements in data analysis, with a strong focus on **particle physics**. Discussion will span across the domain of **machine learning** and **AI**, as well as fundamentals in **statistics**.

By bringing together experts from these diverse fields, we aim to foster discussion, innovative solutions, and collaborations that will drive the future of UQ and its applications.

Time series and causal analysis

The session deals with the data analysis of time series. It also explores the potentialities of causal analysis and inference.

Deep learning and uncertainty quantification

This session is dedicated to applications of deep learning algorithms and uncertainty quantification.

Simulations and coding

The session provides an overview of uncertainty quantification and statistical analysis during development.

HEP - Theory

The session focuses on theoretical aspects of High Energy Physics using machine learning.

HEP - Experiment

The session considers issues and challenges of AI in experimental High Energy Physics.