

ACAT 2014



Monday, September 1, 2014 - Friday, September 5, 2014

Faculty of Civil Engineering

Scientific Program

The workshop builds bridges between computer science, experimental and theoretical physics in three topical areas.

Although mainly focusing on high-energy physics, talks related to nuclear physics, astrophysics, laser and condensed matter physics, earth physics, biophysics and other physics sciences, are most welcome.

Plenary talks are for 30 minutes with 5 minutes for questions. Parallel talks are for 20 minutes with 5 additional minutes for questions.

There will also be a poster session. The recommended format of the posters is A0. The board size is 125cm (w) x 185cm (h).

Poster to board number assignment table: PDF

Tracks:

Computing Technology for Physics Research

Languages, Software quality, IDE and User Interfaces

Languages (new C++ standard, Java, ...)

Software quality assurance; code reflection; documentation, performance and debugging tools

IDE and frameworks

User Interfaces, Common Libraries.

Distributed and Parallel Computing

Multilevel parallelism

Distributed computing

GRID and Cloud computing

New architectures, many and multi-cores

Many-core

Accelerator-based computing (GPU, etc)

High precision computing (hardware)

Virtualisation

Online Computing

Advanced Monitoring, Diagnostics and Control

Scalable distributed data collectors

High Level Triggering (HLT)

Stream event processing & High Throughput Computing (HTC)

Data Analysis - Algorithms and Tools

Machine Learning
Neural Networks and Other Pattern Recognition Techniques

Evolutionary and Genetic Algorithms

Automation of Science: Data to formula

Advanced Data Analysis Environments
Statistical Methods, Multivariate analysis

Data mining

Simulation, Reconstruction and Visualisation Techniques
Detector and Accelerator Simulations, MC and fast MC

Reconstruction Algorithms

Visualization Techniques; event displays

Advanced Computing
Quantum Computing

Bio Computing: life process simulation, brain simulation, Quantum biology

Computations in Theoretical Physics: Techniques and Methods

Automatic Systems
Automatic Computation Systems: from Processes to Event Generators

Multi-dimensional Integration and Event Generators

Intensive High Precision Numerical Computations: Algorithms and Systems

Higher orders
One-loop event generators

Multi-loop Calculations and Higher Order Corrections

Computer Algebra Techniques and Applications

Computational physics, Theoretical and simulation aspects
Lattice QCD,

Cosmology, Universe Large Scale Structure, Gravitational waves

Nuclear physics N-body computation,

Plasma physics,

Earth Physics, climate, earthquakes