

Main topics

The ACAT scientific programme includes the following topics

Track 1: Computing Technology for Physics Research

1. Languages, Software quality, IDE and User Interfaces
 - ◆ Languages (new C++ standard, Java, ...), Code Portability: using templates, toward Compiler
 - ◆ Software quality assurance; code reflection; documentation, performance and debugging tools
 - ◆ Computer system Benchmarking, beyond LinpackComputer system Benchmarking, beyond Linpack
 - ◆ IDE and frameworks
 - ◆ User Interfaces, Common Libraries.
2. Distributed and Parallel Computing
 - ◆ Multilevel parallelism
 - ◆ Distributed computing
 - ◆ GRID and Cloud computing
3. New architectures, many and multi-cores
 - ◆ Many-core
 - ◆ accelerator-based computing (GPU, etc)
 - ◆ High precision computing (hardware)
4. Virtualisation
5. Online computing
 - ◆ Advanced Monitoring, Diagnostics and Control
 - ◆ Scalable distributed data collectors
 - ◆ High Level Triggering (HLT)
 - ◆ Stream event processing & High Throughput Computing (HTC)

Track 2: Data Analysis - Algorithms and Tools

1. Machine Learning
 - ◆ Neural Networks and Other Pattern Recognition Techniques
 - ◆ Evolutionary and Genetic Algorithms, Multi-variate analysis
 - ◆ Package Benchmarking
 - ◆ Automation of Science: Data to formula
2. Advanced Data Analysis Environments
 - ◆ Statistical Methods, Multivariate analysis
 - ◆ Data mining
3. Simulation, Reconstruction and Visualisation Techniques
 - ◆ Detector and Accelerator Simulations, MC and fast MC
 - ◆ Reconstruction Algorithms
 - ◆ Visualization Techniques; event displays
4. Advanced Computing
 - ◆ Quantum Computing
 - ◆ Bio Computing: life process simulation, brain simulation, Quantum biology

Track 3: Computations in Theoretical Physics: Techniques and Methods

1. Automatic Systems
 - ◆ Automatic Computation Systems: from Processes to Event Generators
 - ◆ Multi-dimensional Integration and Event Generators

- ◆ Intensive High Precision Numerical Computations: Algorithms and Systems
- 2. Higher orders
 - ◆ One-loop event generators
 - ◆ Multi-loop Calculations and Higher Order Corrections
- 3. Computer Algebra Techniques and Applications
- 4. 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

-- DenisPerretGallix - 2016-05-12

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