ACAT 2022

Sunday 23 October 2022 - Friday 28 October 2022

Villa Romanazzi Carducci, Bari, Italy

Scientific Programme

Track 1: Computing Technology for Physics Research

This track includes topics that impact how we do physics analysis and research that are related to the enabling technology. Here is a fairly detailed list of possibilities (which isn't, of course, complete!).
Languages, Software quality, IDE and User Interfaces
Languages (new C++ standard, Java, ...), language interoperability, code portability
Software quality assurance; code reflection; documentation, performance and debugging tools
Computer system Benchmarking, beyond Linpack
IDE and frameworks
User Interfaces, Common Libraries.
Distributed and Parallel Computing
Multilevel parallelism
Distributed computing
GRID and Cloud computing
Architectures
New architectures
Massive Multicore
High Performance Computing
Accelerator-based computing (GPGPU’s, FPGA’s)
High and low precision floating-point (quad/octuple precision and short float for CUDA)
Virtualization
Containerization (shifter, remote scripting)
Hardware abstraction
Clouds
Networking
New TCP control and routing mechanism
Alternative to ethernet
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

There are as many different algorithms and methods as their are physicists. Obviously, we can't list them all here, but here are some broad outlines of techniques that fit into this category. Of course, new and novel categories are part of what this conference is looking for.
Machine Learning
Neural Networks and Other Pattern Recognition Techniques
Evolutionary and Genetic Algorithms
Package Benchmarking
Automation of Science: Data to formula
Advanced Data Analysis Environments
Statistical Methods, Multivariate analysis
Data mining
Simulation, Reconstruction and Visualization Techniques
New algorithms for finding tracks, or other objects.
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

Track 3: Computations in Theoretical Physics: Techniques and Methods

This track focuses on computing techniques and algorithms used in the theoretical side of physics research.
Automatic Systems
Automatic Computation Systems: from Amplitudes to Event Generators
Multi-dimensional Integration: Methods and Tools
Intensive High Precision Numerical Computations: Algorithms and Systems
Higher Orders
Matching NLO and NNLO Calculations to 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