Physics plans and ILDG usage in Italy

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Disclaimer: at this time actually not that much in terms of new ILDG configurations

A rough look at LQCD research activities in Italy (only *via INFN research projects I.S.*)

NPQCD Non-Perturbative QCD

Understanding the properties of strong interactions at large distances and in extreme conditions

Pisa LNGS Cosenza Bari

- ✓ QCD phase diagram
- ✓ Color confinement mechanisms and QCD vacuum structure
- ✓ Strongly interacting matter in presence of external fields

✓ not really ILDG oriented

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QCDLAT QCD on the LATtice

Strong interactions in the Standard Model and beyond and lattice field theory

Milano Bicocca Parma Ferrara Roma1 Roma2 Pavia

- ✓ QCD in the chiral regime
- ✓ Equation of state of QCD at zero chemical potential
- ✓ NSPT
- ✓ Sign problem (thimble regularization)
- ✓ Algorithmic challenges (also disordered systems)

- ✓ ILDG in the framework of CLS policy

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LQCD123 LATTICE QCD

A first principle approach to phenomenology with Lattice QCD

Roma1 Roma2 Roma3

- ✓ Isospin breaking, QCD+QED corrections
- ✓ b Physics
- ✓ Light and charm Physics
- ✓ Chromomagnetic operators (electroweak effects in SM and beyond)

- ✓ ILDG in the framework of ETMC policy
- ✓ (at the moment production in n_f=2+1+1; deposit in 2017?)

Computing facilities at CINECA:

Fermi (BlueGene/Q 2.1PFlops peak since 2012) still there only for a few months…

Galileo (IBM NeXtScale 1PFlops peak since 2015)

20% INFN

System Architecture

Model: IBM NeXtScale
Architecture: Linux Infiniband Cluster
Nodes: 516
Processors: 8-cores Intel Haswell 2.40 GHz (2 per node)
Cores: 16 cores/node, 8256 cores in total
Accelerators: 2 Intel Phi 7120p per node on 384 nodes (768 in total)
RAM: 128 GB/node, 8 GB/core
Internal Network: Infiniband with 4x QDR switches
Disk Space:2,500 TB of local storage
Peak Performance: xxx TFlop/s (to be defined)

REAL NEWS 1: MARCONI (new Tier0 @CINECA) on its way!

6% agreed of a grand total of [2] [2+11] [7+11] PFlops

REAL NEWS 2: CIPE (this means Min. of Finance) is going to fund an INFN HPC system (order 2PFlops peak?)