

**PRESENT AND FUTURE OF HIGH PERFORMANCE COMPUTING**  
**Trends, Challenges, and Opportunities**

November 17, 2008, Sala Consiglio di Facolta', Politecnico di Torino

**14:30-14:40**

**Opening Address**, Prof. Francesco Profumo, Rector, Politecnico di Torino

**14.40-15:20**

**HPC: an Innovation and Collaboration Driver**

Dr. George Katopis, Distinguished Engineer, IBM Systems Group, Poughkeepsie, USA

In this talk one potential role for a Polytechnic school in the new era of globalization and collaboration will be proposed. This view will be based on the application of the concept of innovation to this type of academic institution and the new technology of High Performance Computing. Several types of supercomputers will be highlighted along with their salient features and preferred applications. Selected applications that are related to the engineering research taking place in a Polytechnic educational environment and which can be benefited by the HPC technology will be described. The talk will conclude with an incomplete enumeration of future challenges that the HPC technology can enable the members of a Polytechnic community to successfully address.

**15:20-15:50**

**"Sustainable" HPC Strategy: The EPFL Case Study**

Prof. François Avellan, Chairman of the Steering Committee for HPC, EPFL, Lausanne, Switzerland

The presentation intends to describe the EPFL strategy rolled out throughout the campus for securing the maximum benefit for the 6'500 students and the researchers of the 250 laboratories of the HPC facilities and resources. First, the EPFL high performance computing facilities are presented. These facilities are spanning from the 22.9 Tflop/s BlueGene/L system to GREEDY, the campus computing grid. Then, the EPFL "sustainable" strategy for HPC is discussed as a kind of 'step ladder' approach. Finally, exemplary research project achievements spanning several domains of science and engineering are emphasized, to explore the very broad scope of investigations enabled by HPC.

**15:50-16:00 Break**

**16:00-16:30**

**CINECA: an Advanced HPC Infrastructure in Italy for Challenging Scientific Applications**

Dr. Carlo Cavazzoni, Supercomputing Group, CINECA, Italy

CINECA is the leading supercomputing centre in Italy. Since its foundation, in 1969, CINECA has made available top level HPC facilities to the Italian universities and research institutions, giving them the possibility to be competitive worldwide in the field of computational sciences. CINECA has also a strong commitment in training and high level education in HPC, running courses, summer and advanced schools, degree and PhD programs open to everybody from academia and industries. CINECA is involved in different projects funded by the EC in the field of HPC Research infrastructures (HPC-Europe, DEISA; PRACE) cooperating with the leading supercomputing Centres at European level. Thanks to these characteristics the scientific communities collaborating with CINECA have significantly grown both in number and quality of the research. In order to further support this growth, CINECA is going to deploy a new 100 TFlops class HPC infrastructure in 2009 and creating the conditions to deploy a 1PFlops class infrastructure in 2012/2013.

**16:30-17:00**

**An Overview of Present and Future Local HPC Research Activities**

Prof. Stefano Grivet-Talocia, Dipartimento di Elettronica, Politecnico di Torino

Simulation-based Engineering Sciences are expected to play a revolutionary role in Technology during the current century. Our main goal is to realize a local community, with the support of a proper infrastructure, that will help Politecnico di Torino becoming a major player in the arena of Modeling and Simulation through High Performance Computing. Leading research activities of various groups of Politecnico showing the potential of a substantial qualitative/quantitative boost from the availability of a HPC infrastructure are reviewed. The fundamental enabling factors are hardware, people, support, commitment, logistics, infrastructure and especially education.

**17:00-17:10**

**Closing Remarks**

Prof. Claudio Canuto, Dipartimento di Matematica, Politecnico di Torino