

# Gauss and PACE: Combining Resources establishes powerful Supercomputing Organizations

Providing computing resources at the highest performance level for computer-based science and engineering in Germany and Europe: this is the common denominator behind current decisions made by German and European supercomputing facilities. First, the three German national supercomputing centres joined up to form the Gauss Centre for Supercomputing (GCS) with combined computing power of more than 120 TFLOP/s located in Stuttgart, Garching, and Jülich. Next, the Gauss Centre and Partners from 14 European countries founded the consortium PACE – Partnership for Advanced Computing in Europe.

The top computers of the Gauss Centre have a total computing power of 120 TFLOP/s at their disposal. This computing power is distributed among the partners' sites:

the High-Performance Computing Centre Stuttgart (HLRS), the Leibniz Computing Centre (LRZ) in Garching near Munich, and the John von Neumann Institute for Computing (NIC) at Research Centre Jülich. It is planned to increase the overall performance of the Gauss Centre to a value larger than 1000 TFLOP/s (1 PetaFlop/s) within the next years.

The Gauss Centre's members, who signed an agreement to found a registered association (GCS e. V.) on April 13<sup>th</sup>, will now follow a common direction in this organization. The procurement of hardware will be more closely coordinated, applications for computing time will be scientifically evaluated on a common basis, and software projects will be jointly developed. Another key area will be training. The work of specialist researchers will be supported and promoted by harmonising the services and organizing joint schools, workshops, and conferences on simulation techniques. Methodologically oriented user support is also a major concern of the Gauss Centre.

The Federal Ministry of Education and Research (BMBF), the Ministry of Innovation, Science, Research and Technology of the State of North Rhine-Westphalia, the Bavarian State Ministry of Science, Research and the Arts, and the Ministry of Science, Research and the Arts Baden-Württemberg unreservedly support the Gauss Centre for Supercomputing which is the largest national association for high-performance

computing in Europe. The high-speed computer network and the scientific cooperation at the three sites are being funded by the BMBF in order to ensure that this leading international position will be maintained in future by means of optimized structures and organization. The three sites are thus making themselves visible throughout Europe and play a central role in the establishment of a European high-performance computer network. For further details see <http://www.gauss-centre.eu/>

Also, European scientists and engineers will be able to turn to a new resource when it comes to supercomputing. Top representatives from research institutions in 15 countries have recently laid the foundation for a leading international supercomputer infrastructure and created a European supercomputing network: PACE – Partnership for Advanced Computing in Europe. With a combined effort, Europe should stay at the top of the international competition.

The central idea behind the new partnership is a joint network of supercomputer resources with different locations, linked together by the most modern network technology. The costs were estimated by the European Strategy Forum on Research Infrastructures (ESFRI) in fall 2006 in the order of several hundred millions of Euros. They have to be covered to a large extent by national sources. The rest will be provided by the European Union through the 7<sup>th</sup> Research Framework Programme.

PACE aims at a European supercomputer eco-system that can be described in terms of a performance pyramid. At the top are a small number of leadership-class supercomputing systems, funded through national sources, with

additional European funding. The middle layer of the pyramid consists of a number of national and regional supercomputers. These still should be powerful supercomputers being able to run the load below PetaFlop/s level. The bottom of the pyramid consists of local compute servers that should enable the development of a strong competence base of computational scientists.

The PACE consortium, founded formally in Berlin on April 17<sup>th</sup> by signing a corresponding Memorandum of Understanding, is made up of France, Germany, Netherlands, Spain, United Kingdom, Austria, Finland, Greece, Italy, Norway, Poland, Portugal, Sweden, Switzerland, and Turkey.

Together the members of PACE will strengthen European science, engineering and supercomputer technologies and thus secure Europe a pioneering role in the global competition.

In the coming preparatory phase of two and a half years PACE will test prototypes of Petaflop Machines and make proposals on how the funds should be efficiently deployed. The conceptual design report is the first step towards a globally competitive organizational structure for scientific computing in Europe. The principle behind this goal is using the equipment and expertise of the PACE partners, not in competition among themselves, but rather as complementing each other.



PACE representatives of the 15 participating countries together with the Federal Minister Dr. Annette Schavan

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