The PRACE Project and using the high performance computing for large Monte Carlo simulations

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PRACE, the Partnership for Advanced Computing in Europe, is creating a persistent pan-European High Performance Computing (HPC) Research Infrastructure (RI) and related services. Four nations (France, Germany, Italy and Spain) have agreed to provide 400 million Euro to implement supercomputers with a combined computing power in the multi Petaflop/s range over the next 5 years. This funding is complemented by up to 70 million Euros from the European Commission which is supporting the preparation and implementation of this infrastructure. These leadership class systems will help European scientists and engineers to remain internationally competitive. PRACE will maintain a pan-European HPC service consisting of up to six top of the line leadership systems (Tier-0) well integrated into the European HPC ecosystem. Each system will provide computing power of several Petaflop/s (one quadrillion operations per second) in midterm. On the longer term (2019) Exaflop/s (one quintillion) computing power will be targeted by PRACE. Users will be supported by experts in porting, scaling, and optimizing applications to novel, highly parallel computer architectures. An in-depth training program accompanies the PRACE offering teaching scientists and students how to best exploit the unprecedented capabilities of the systems. A scientific steering committee will provide advice to PRACE and operate alongside a bespoke peer review process through which access to the Tier-0 resources will be granted based on scientific excellence.

Now, PRACE members are: Austria (JKU University Linz, Institute for Computer Architecture), Bulgaria (NCSA National Center for Supercomputing Applications), Cyprus (CaSToRC - Computation-based Science and Technology Research Center), Czech Republic (VB Technical University of Ostrava), Finland (CSC IT Center for Science), France (GENCI Grand Equipement national pour le Calcul Intensif), Germany (GCS GAUSS Centre for Supercomputing), Greece (GRNET Greek Research and Technology Network), Ireland (ICHEC Irish Centre for High-End Computing), Italy

(CINECA Consorzio Interuniversitario), The Netherlands (NCF Netherlands Computing Facilities Foundation), Norway (SIGMA UNINETT Sigma AS - The Norwegian Metacenter for Computational Science), Poland (PSNC Poznan Supercomputing and Networking Center), Portugal (FCTUC - Faculdade Ciencias e Tecnologia da Universidade de Coimbra), Serbia (IPB Institute of Physics, Belgrade), Spain (BSC Barcelona Supercomputing Center - Centro Nacional de Supercomputacin), Sweden (SNIC Swedish National Infrastructure for Computing), Switzerland (ETH Zurich Swiss Federal Institute of Technology Zurich, CSCS Swiss National Supercomputing Centre), Turkey (UYBHM National Center for High Performance Computing), UK (EPSRC Engineering and Physical Sciences Research Council).