Welcome Address – PRACE – In Service of HPC in Europe

Thomas Lippert, Chair of PRACE Council

A very warm good morning, ladies and gentlemen, dear Prof. Lu, dear Meuer brothers,

It is a great honour to welcome you here today on behalf of PRACE at the opening of one of the most important conferences worldwide in the field of High Performance Computing, and without a doubt the most important conference in Europe for so many years.

Working in the field of supercomputing, be it technology or applications, is not just a profession, it is a true vocation, and for most of us supercomputing is actually a big part of our lives.

We do not have to ask ourselves long why this is so: to understand, to decipher or to anticipate the phenomena of this world by means of computation is anchored very deep in our genes. With the supercomputer we strengthen this our ability virtually to the immeasurable, scales grow in supercomputing by a factor of 1000, from mega to giga, to tera, to peta and soon exa. Nowhere else do we know such a development. It is no wonder that the complexity of the systems in terms of their hierarchical levels on the hardware and software side and the multitude and heterogeneity of the used elements follows this development as we need to fight complexity by complexity. Such a development of giant new machines and superlativistic applications fits perfectly with our human nature, which tends to feel highly competitive and always wants to be at the front.

Is this all what it is about? By far not! All these successes in supercomputing are only possible because we, as humans and especially in science, are extraordinarily good at co-operating with each other. The long-term existence and coherence of this conference is direct proof.

In this respect, something very special has been achieved in Europe, that we can rightly call the epitome of cooperation in computational science and engineering: It is PRACE - The Partnership for Advanced Computing in Europe. PRACE, the "P", stands for partnership, and there is a group of like-minded people who like this RACE.

"In Service for HPC in Europe"! This is PRACE in short. PRACE offers a comprehensive range of services and support activities to promote the European HPC ecosystem. PRACE is established as the link between the

HPC infrastructures of the European member states and the European HPC users. The current scientific case study of the PRACE Scientific Steering Committee provides a comprehensive overview of the strategic importance of high-performance computing in a growing number of scientific and technical fields and industries. It provides convincing arguments for the convergence of simulation, large-scale data analysis and, above all, the importance of HPC for progress in artificial intelligence with deep learning, transfer learning and continuous learning.

Almost ten years ago the 26 PRACE partner started with services for European science. PRACE is supported by the PRACE Member States and by the EU through a number of implementation projects and thus has been able to form a common European umbrella over the national HPC ecosystems. It is difficult to list all the achievements we have made in the meantime, when we speak of over 70 partner institutions, 7 top-class systems, 700 large-scale projects, over 100 petaflop/s accumulated peak performance, 12000 trainees in PRACE advanced training courses, seasonal schools, numerous companies supported, peer review on the European level, a unified set of pan-European operational services comprising many satellite centers, support of Industry, the High Level Support teams, market watch, support for CoEs, etc. etc.

Since the beginning of 2019, we have all been thrilled to welcome a new force in Europe, the EuroHPC Joint Undertaking. The EuroHPC Joint Undertaking will advance the European supercomputer landscape by completing the infrastructure pyramid at the highest level with European supercomputers of the highest quality. Recently three pre-exascale systems have been announced in Barcelona, Bologna and Helsinki, with capabilities of about 200 petaflop/s. These systems will be complemented by 5 petascale machines in Bulgaria, the Czech Republic, Luxembourg, , Portugal and Slovenia. Congratulations to the sites and to Europe.

PRACE and EuroHPC have almost complementary missions. While EuroHPC acts as a high-level funding agency and must essentially be top-down, PRACE is science-driven acting bottom-up. Combining the two in a strong partnership will create the best possible synergies.

For European HPC users from science and industry, the seamless and immediate integration of these new high-level systems and services into the existing European HPC ecosystem is of key importance.

PRACE will increase its creative efforts to ensure that this is done smoothly and that Europe is at the forefront of developing the technological, scientific, industrial and societal application of HPC on an internationally competitive basis.

As some of you may know, I am scientifically committed to a new paradigm in computing, I named it "modularity". It is about composable systems, disaggregation and the dynamic formation of virtual supercomputers, in short I am talking about the “data center of the future”. I have the vision that the future of supercomputing at the European scale to be quite analogous to this: dynamic coupling of resources, the best possible data federation, creation of a European HPC cloud and the dynamic use of systems in the range from peta to exascale, and beyond. These are very exciting future prospects.

On behalf of PRACE, I wish you all an inspiring ISC 2019!