Technische Universität Dresden named a CUDA Center of Excellence

Dresden, March 1st, 2012 – The TU Dresden has been named a CUDA Center of Excellence by NVIDIA, the world leader in visual and high-performance computing.

CUDA is NVIDIA's parallel computing architecture that enables dramatic increases in computing performance by harnessing the power of the graphics processing units (GPUs). The NVIDIA CUDA Center of Excellence program recognizes, rewards and fosters collaboration with leading institutions at the forefront of parallel computing research.

TU Dresden with its partners Helmholtz-Zentrum Dresden-Rossendorf (HZDR) and Max Planck Institute of Molecular Cell Biology and Genetics (MPI-CBG) acting under the common roof of the DRESDEN-concept e.V. joins 17 elite institutions worldwide that have demonstrated a unique vision for improving the technology and application of parallel computing, and empowering academics and scientists to conduct world-changing research. CUDA Center of Excellence members are provided with NVIDIA GPU equipment and research grants.

Members from the Center for Information Service and HPC (ZIH), TU Dresden and HZDR are leveraging NVIDIA GPUs to accelerate highly complex simulations of the inner workings of plasma, as they are used in modern cancer therapy and fusion reactors. As a result, researchers were able reduce time to process scientific calculations from weeks to a few days. In addition, by accelerating expensive and complex experiments in Biology and Radiology, system utilization is increased, enabling research in other areas to benefit from GPU computing.

Due to these rich benefits enabled by GPU computing, Simunova, a developer of generic programming methods for computational sciences, such as the matrix template library (MTL), decided to join the center.

"GPU computing is an integral technology that enables the acceleration of time-critical simulations in the computational sciences", says Prof. Dr. Wolfgang E. Nagel, TU Dresden – director of the center – and also adds: "I am impressed by the creativity of the scientists of the different research areas in using this modern technology. They help position Dresden as a leader in the ongoing footrace for new scientific advances."

As part of this cooperation the scientists from the areas of biology, computer science, physics, mechanical engineering, medicine, and mathematics as well as the industry partners use synergies in research and development also in other research fields. Hence, they offer practical education in GPU accelerated computational simulations to students of TU Dresden. Furthermore, leading experts in various fields that also use GPU computing will present their work in monthly seminars and an annual workshop in Dresden to also offer a stage for discussion and further cooperation.

"NVIDIA congratulates TU Dresden and its partners on achieving this special recognition," says Stefan Kraemer, NVIDIA sales director HPC – education. "TU Dresden is the first German institution to receive CUDA Center of Excellence status, joining other world-renowned universities and institutions that are using GPUs to accelerate scientific research, including the Barcelona Supercomputing Center, Cambridge University, Stanford University, and the University of Moscow."

Research groups utilizing GPU computing at TU Dresden include: Prof. Cown (HZDR, Radiation Physics), Dr.

Gerbeth (HZDR, Fluid Dynamics), Dr. Gottschling (SimuNova), Prof. Gumhold (TU Dresden, Computer Science, Computer Graphics and Visualization), Prof. Hochberger (TU Dresden, Computer Science, Embedded Systems), Prof. Koch (TU Dresden, Medical Faculty), Prof. Lehner (TU Dresden, Computer Science, Databases), Prof. Nagel (TU Dresden, ZIH / Computer Science, Computer Architecture), Dr. Posselt (HZDR, Ion Beam Physics and Materials Research), Prof. Schroer (TU Dresden , Structural Physics), PD Dr. Stiller (TU Dresden, Fluid Dynamics), Prof. Tetzlaff (Tu Dresden, Fundamentals of Electrical Engineering), Prof. Voigt (TU Dresden, Computation Science), and Prof. Zerial (MPI-CBG).

The NVIDIA CUDA Center of Excellence program is competitive and prestigious, and any institution with a demonstrated commitment to both parallel computing research and education may apply for CCOE status. For more information visit: http://research.nvidia.com/content/cuda-centers-excellence.

About the TU Dresden:

The TU Dresden is among the top universities in Germany and Europe: strong in research, offering first-rate programmes with an overwhelming diversity, with close ties to culture, industry and society. As a modern full-status university with 14 departments it offers a wide academic range making it one of a very few in Germany. TU Dresden is the largest university in Saxony with over 36500 students. As a "synergetical university" TU Dresden closely cooperates with external research institutions, cultural, industrial and social organisations. In 2009 TU Dresden started an association of 14 cultural and research institutions called DRESDEN-concept (Dresden Research and Education Synergies for the Development of Excellence and Novelty), which is unique in Germany. www.tu-dresden.de

About the HZDR:

Research at the Helmholtz-Zentrum Dresden-Rossendorf focuses on the following topics: How does matter behave in strong fields and at small-scale dimensions? How can malignant tumors be identified at an early stage and treated effectively? How can resources and energy be used safely and efficiently? To answer these scientific questions, five large-scale research facilities provide, in part, unique research opportunities. These facilities are also accessible to external users. The HZDR has been a member of the Helmholtz Association, Germany's largest research organization, since January 1, 2011. It has four locations in Dresden, Freiberg, Leipzig, and Grenoble and employs around 800 people – 400 of whom are scientists including 130 doctoral candidates. www.hzdr.de

About the MPI-CBG:

The Max Planck Institute of Molecular Cell Biology and Genetics (MPI-CBG) is one of 80 institutes of the Max Planck Society, an independent, non-profit organization in Germany. MPI-CBG was founded in 1998 and since February 2001, scientists from over 40 nations have been working under one roof. The Institute has a core staff

of about 400 scientists, who form a network of 25 research groups covering different topics at the interface of cell biology and developmental biology including research investigating illnesses such as cancer or Alzheimer's disease. For example, at the MPI-CBG researchers study how the growth of cells is controlled and why this control process fails to function properly in cancer cells. Once science has an understanding of how cellular control systems work, currently incurable illnesses may be diagnosed earlier with a view to developing more effective treatments. The MPI-CBG has forged partnerships with technology providers in many of its major areas of research since it believes that the greatest insight and new discoveries are made when innovations in new technologies allow problems in research to be addressed or investigated in new ways. www.mpi-cbg.de