

CHPC hosts third national meeting in KwaZulu-Natal

Local and international high performance computing experts, users and students travelled in their numbers to attend the third national meeting of the Centre for High Performance Computing — CHPC2008 — on 9-10 December 2008, held on the Westville campus of the University of KwaZulu-Natal (UKZN) in Durban. Themed 'Fostering a broader base of computational researcher', this event drew some 200 local and international speakers and delegates from academia, science councils, industry, computer vendors and government.



The CHPC is funded by the Department of Science and Technology (DST), and managed by the Meraka Institute of the CSIR. Together with the South African National Research Network (SANReN) and the South African Centre for Very Large Databases initiative, CHPC is an important element of South Africa's evolving cyberinfrastructure.

By hosting CHPC2008 on the Westville campus of UKZN, the CHPC has demonstrated its national reach; its past two national meetings took place in Cape Town, where its offices and computer resources are located. Dr Happy Sithole, director at CHPC and head of the organising committee for the events, explains, "Our decision to take the meeting to another province was prompted by the need for emphasising the benefits of HPC to the entire South African research community. This meeting has drawn several international speakers, including Dr Eugene Yeh, director of our equivalent in Taiwan, the National Center for High-Performance Computing and Dr Kevin Franklin, executive director of I-CHASS, the Illinois Center for Computing in Humanities, Arts and Social Science."

Sithole confirmed that the meeting will be hosted on a rotational basis throughout South Africa and will be aligned with international supercomputing events. "In this way, we hope to increase technical contributions as well as participation by even more international speakers. It's about what HPC can do and how it is realised by the whole HPC community."

An additional motivation for holding the event in Durban, was provided through the KZN HPC forum. Professor Gert Kruger of the UKZN School of Chemistry and head of the KZN HPC forum and Professor Francesco Petruccione of the School of Physics have for five years been responsible for bringing together parties interested in HPC from academia (which includes the University of Zululand and other tertiary education institutions, industry and local and provincial government). "In the light of our activities as an HPC forum, we made an offer to the CHPC to host this event," confirms Kruger.

In his welcome address, Dr Johan Jacobs, acting Deputy Vice-Chancellor of Research, Knowledge Production and Partnerships of UKZN, welcomed international speakers from around the world as well as the range of delegates. As an English scholar, he was impressed with the "language and narratives of HPC" and the impressive range and expertise at the meeting as well as the range of themes for the different sessions. He noted HPC as an imperative in the forefront of science and its role in supporting the importance of African scholarship.

Dr Yonah Seleti, acting Deputy Director-General of Human Capital and Knowledge Systems of the DST clarified the goals of South Africa's cyberinfrastructure strategy within the context of the DST's 10 year vision. "The DST is delighted to be part of the national meeting and endorses this participatory approach," he noted. "Your success is our success." As an enabler, HPC should be harnessed to support sustainable economic growth and a modern competitive economy, in which science and technology has relevance and benefit to South African citizens. In terms of the five grand challenges as laid out by the DST — energy, space, global change, pharma to farmer, and human and social dynamics — HPC would play an increasingly important roles by stimulating research for knowledge generation.

Professor Colin Wright, head: research at CHPC, outlined plans to increase research participation and grow the HPC, while emphasising the need to "invert conventional wisdom" when considering issues of hardware acquisition. "Software is the key in the parallel world in which we operate," he noted.

The two-day national meeting also allowed delegates the opportunity to update themselves on information regarding the latest plans, developments and operational platforms delivered by senior management of the CHPC.

External HPC perspectives, both local and international, highlighted the range and extent to which HPC has become an indispensable part of research aimed at global challenges such as the economic meltdown, climate change, the environment and energy, the supply chain of food and medicine while the first day concluded with a session on e-infrastructure and society. A presentation by the Meraka Institute's Geoff Daniell confirmed the status of the SANReN rollout and its potential to facilitate research collaboration and sharing of large datasets.

The event was supported by a select group of vendors including a sponsorship from Microsoft, which would be used towards funding for a student bursary at the UKZN computer science department. Novell donated three full SUSE Certified Linux Professional Self-Study kits. Eclipse also agreed to provide sponsorship for a student to attend the upcoming International Supercomputing Conference 2009 (ISC '09). Dr Ralph Warmack, an IBM Blue Gene specialist, was sponsored by IBM to address the conference on *Smarter science for a smarter planet*.

Presentations by the CSIR and the Meraka Institute included Dr Arnaud Malan: *A new unified fluid-structure interaction modelling technology for aerospace applications*; Uli Horn: *Implementing virtualisation on the high performance computer at the CSIR*; Albert Gazendam: *Where South Africa should be putting its HPC focus*; and Nelson Selisa: *SGE transfer queue for gLite*.

Given CHPC's support for users across many spheres of academia and industry, several high-profile research projects currently utilising this infrastructure focus on materials science, astrophysics, oceanography, climatology, bioinformatics, fluid dynamics, finite element modelling, astronomy, high energy physics and quantum computing modelling. In turn, CHPC scientists are using HPC techniques in research areas ranging from meteorological modelling, space physics and astrophysics, visualisation and virtual reality, and computational mechanics and electromagnetics.

A recent addition to its capacity has been the Blue Gene/P machine, donated by IBM. As a seminal part of the BG4Africa or Blue Gene for Africa initiative, this machine is dedicated to collaborative projects requiring massive computational power, and which focus on challenges unique to Africa.

The conference was followed by five successful workshops including the CHPC General Users Induction Training; Parallel computing with Matlab; a Gaussian users workshop and a Gaussian installation workshop; a GRID computing workshop and a Microsoft HPC workshop. These workshops attracted over 90 participants.