



30 August 2009

Call for Proposal 2010 Consortium Research Project

Introduction

The remit of the Centre for High Performance Computing (CHPC) is to advance scientific boundaries by enabling world-class research through promoting and facilitating the use of high performance computing (HPC) innovations by South African based researchers and stakeholders. Presently, the Centre invites all researchers to take advantage of its computational infrastructure and the application to utilise the CHPC computational platforms can be readily accessed from its website: www.chpc.ac.za.

Apart from assisting general users, the CHPC intends to leverage the expertise of our computational researchers in addressing a variety of scientific- and socio-economic challenges whose solution can be advanced with the utilisation of innovative HPC solution(s). Considering that the nature of these grand challenges can be highly intricate, their solutions may require a multifaceted range of expertise which may well be dispersed over different niche research groups within the country. Hence the objective of the Consortium Research Project is to provide a leveraging mechanism to harness collaboration between South African-based scientists and promote an exchange of knowledge amongst the members of our HPC communities. It is envisaged that each consortium will provide the scientific know-how towards furthering the mission of a particular project, whereas the CHPC will commit to provide financial and computational support. Furthermore, each consortium will be required to assist the CHPC to foster a new generation of computationally skilled researchers. During the funding cycle, consortia will be requested to implement at least two advanced workshops relevant to the research domain of the project and give special bursaries to encourage senior undergraduate students and/or junior postgraduate students from previously disadvantaged backgrounds to pursue careers in computational research.

Guidelines

This open call for proposals is aimed at encouraging South African-based computational researchers to self-assemble into small consortia (3 to 5 investigators each) and submit a synopsis of a joint project which falls into the context of high performance computing. The eligibility criteria for investigators may be found in section 3.

All proposals will be judged on the following criteria:

1. The Consortium Research Project must aim to resolve a noteworthy challenge through the collective effort of a consortium of South African-based researchers. Each consortium will be encouraged to form partnership with international peers, particularly with scientists from African states and/or commercial stakeholders.
2. The consortium should preferably consist of multi-disciplinary and/or multi-institutional researchers. It is envisaged that through a collective approach, the fundamental drive behind the consortium will address one of the following:
 - i) a well identified major scientific/technological problem in a specific field, and/or
 - ii) a noteworthy socio-political and/or socio-economic South African or African problem.

The coherency of research agendas amongst different members of the consortium will be viewed as a critical factor in the evaluation of the proposal.

3. The proposal will be reviewed by a panel of referees consisting of at least 8 representatives from local and international scientific organisations. Two different categories of proposal will be accepted by the referee panel:
 - i) Category A – Innovation and utilisation of HPC Tools
It has been well-proven that a joint research effort between technology developer(s) and application-based investigators can generally lead to a productive partnership. Considering that the advancement of niche technology (codes or hardware) can enhance the research output of scientific disciplines, therefore the technology innovated by the developer must be effectively disseminated to and fully utilised by the co-investigators. It is envisaged that the consortium will make provision for the newly established technology to be available to the rest of the South African research community by the end of the funding cycle.

ii) Category B – Discovery through the Deployment of HPC Tools

A challenge can be addressed by a multi-faceted collaboration amongst computational researchers, where mature codes are readily accessible and capable of being immediately massively parallelized. It is expected that within no more than 3 months of porting onto the CHPC platform, the members of the consortium will perform their investigation by utilising a substantial amount of the CHPC computational resource. It is important to emphasize that those consortia which make use of open-source or academic software packages will be given preferential consideration during the evaluation of the pre-proposal.

4. Proposals which include CHPC personnel and/or in accordance with CHPC own research agendas will be highly encouraged. Some of the possible topics are as follows:
 - the utilisation of niche computational architectures: FPGAs, GPGPUs and cell computing; in a specific research domain;
 - the development or the modification of applications, libraries and/or algorithms which can accelerate the research output of a range of CHPC Special Interest Groups;
 - the advancement of scientific visualisation and/or interactive computer graphics technologies.
5. The CHPC supports the transformation agenda of South Africa. Consortia which exhibit a strong potential to further the transformation process will be preferred. The Equity Development capacity of each consortium will thus be evaluated. In addition, consortia will also be held to an obligation to foster the development of the relevant research field by facilitating the CHPC to co-host advanced workshops in conjunction with other stakeholders.
6. Each proposal must exhibit a strong potential to support high school science outreach programmes and the capability to promote the importance of computational science to the general public.

The referee panel will assess proposals not only according to the impact of their scientific merits but also on their potential to fulfil the abovementioned criteria and the capability of the consortium to address the challenge in a highly coherent manner. Moreover, as the CHPC is a research institution, it intends to act as an agency which harnesses and grows a vibrant ecosystem within the HPC context. Consortia are

therefore encouraged to collaborate with the CHPC as a working partner and not merely as a funding agency. Proposals with all round mutual benefits that aspire to reward the development of the consortium, a wider context of South African research communities and the CHPC will be given a valued status.

Eligibility criteria

Each consortium must take account of the following criteria:

1. The CHPC will only provide financial support to investigators who hold a permanent full-time academic or scientific research staff position from a non-profit organization (such as tertiary education institutes (TEIs) or other research organizations such as science councils and museums) within South Africa. Consortia may however utilize the funding designated for the implementation of the advanced workshop(s) as a means to invite international collaborators to deliver or attend workshops in South Africa and subsequently strengthen their international collaboration.
2. Each investigator of the consortium listed in the proposal must be an affiliated member of the relevant CHPC Special Interest Group (SIG) or have the support of the CHPC in the event that an appropriate SIG does not exist.
3. Each investigator must display research leadership potential in supervising the training of postdoctoral and post-graduate research students of recognised South African TEIs. Furthermore, previous research track record of the investigator in the relevant field of research is a prerequisite.
4. Each investigator must demonstrate financial and technical support from his/her institution in collaborating with the CHPC.

Submission Process and Funding Scheme

In order to be eligible to submit a formal proposal, the Principal Investigator (PI) must gather the appropriate co-investigators and submit a joint proposal to the CHPC Research and HCD Office before 5pm on Friday 16th October 2009. The application form can be downloaded from www.chpc.ac.za/FlagshipProject/Application and the proposals must be submitted electronically to the CHPC R&HCD office (email address: yjchen@csir.co.za). Only electronic copies of the proposal will be accepted. Please note that while the guidelines for this Call for Proposal are in .pdf format, the application form of the Consortium Research Project will be in an .odt format. In order to complete the application form, please download OpenWriter from this website <http://download.openoffice.org/> .

Consortia which submit the Proposal under the ethos of Category A – Innovation and utilisation of HPC Tools (listed in 2.3(i)) will be given 36 calendar months of CHPC financial support whereas consortia which submit the Proposal under the ethos of Category B – Discovery through the deployment of HPC Tools (listed in 2.3(ii)) will be given 24 calendar months of CHPC financial support. It is anticipated that within 6 calendar months after the end of the funding cycle, each consortium will be able to deliver a workable innovation within the context of HPC or publish an adequate number of publications in major high-profile peer-reviewed scientific journals or both.

Apart from the significant compute time on the new multi-teraflop CHPC facility, the full package of the Consortium Research Project funding scheme also consists of monetary support which ranges from approximately seven hundred thousand to one million Rand (R700,000 – R 1,000,000) per 12 calendar months. The successful consortium can leverage this funding to attract postgraduate students and postdoctoral fellows in an attempt to boost the progress of the project. Each consortium may make use of this funding to cover some of its operational expenses, to implement at least two Advanced Workshops and to provide special bursaries with which to attract students from previously disadvantaged backgrounds to pursue their careers in computational research. A detailed breakdown of the funding and full expectation of the investigators will be revealed to the consortia of successful proposals.

All proposals will be evaluated by a referee panel appointed by the CHPC Research and Human Capital Development Office in consultation with the CHPC's Scientific Advisory Committee. It is envisaged that the status of proposals will be announced by end October 2009 along with the full budget framework and deliverable expectations. Thereafter, the particular consortium can evaluate terms and conditions of the funding scheme before deciding if it will accept or decline its collaboration with the CHPC. Consortia which formally accept the terms and conditions will be invited to deliver a public presentation at the 6th Annual CHPC National Meeting (07-09 December 2009).

Contact Details

For further information, please contact Professor Colin Wright (Head of Research) or Dr. Jeff Chen (Acting Operations Manager) at the CHPC via e-mail: cjwright@csir.co.za or jyichen@csir.co.za respectively.