Astronomy Australia Ltd.

Astronomy Supercomputer Time Allocation Committee

Allocation of time on Australian Supercomputing Resources
** The current call for proposals closes at **5pm (AEST) Thursday 1st June 2017**. **

ASTAC has issued a call for proposals for the use of the following resources from 1st July 2017 to 31st December 2017 (i.e. Quarters 3-4, 2017). This document describes the resources available under the NCI Astronomy Flagship Program, gSTAR/swinSTAR supercomputers, and Pawsey ATHENA program.

Note that the following description of resources uses the concept of a service unit (SU), which is approximately equivalent to a CPU-core-hour on the relevant facility. Proposers for gSTAR should be aware that this is also true for GPU-based computations and carefully read the specific instructions for this facility.

1. NCI Astronomy Flagship Program: up to 1,000 kSUs.

This program is targeted at highly scalable astrophysics codes that can take advantage of at least 256 cores for highly parallel computation on a well-balanced, high-performance computing system such as the Fujitsu Primergy System 'Raijin' at the NCI National Facility. More information on the NCI supercomputer hardware can be found on the NCI National Facility website: http://nf.nci.org.au/facilities/fujitsu.php. See also http://nf.nci.org.au/facilities/ for additional information about the facility and the available software.

2. gSTAR and swinSTAR: 1,700 kSUs (1,200 kSUs prioritised for GPU-based projects).

gSTAR and swinSTAR are both part of the Swinburne HPC facility (Green II). It comprises 53 nodes each with 12 Westmere X5650 CPU cores. 50 of these nodes contain two NVIDIA C2070 graphics programming units (GPUs) and the remaining three nodes each have seven M2090 GPUs. Each C2070 and M2090 GPU provides more than 1 Teraflops of performance (single precision, about half this for double precision). The facility also houses 86 nodes each with 16 Intel E5-2660 processor cores. 64 of these nodes contain an NVIDIA K10 GPU with a theoretical performance of 4.58 Teraflops (single precision, about 0.1 Teraflops double precision). Each node in the system contains 4GB RAM per CPU-core and is networked via non-blocking QDR infiniband. More information about the hardware can be found on the Swinburne HPC website: http://supercomputing.swin.edu.au/.

It should be noted that while 1,200 kSU is prioritised for GPU-based proposals, the 1200/500 GPU/CPU split is not rigid and will depend on the volume (and quality) of GPU-based versus CPU-based proposals.

In calculating SUs requested on gSTAR GPU nodes, researchers should note that the time available is measured in core hours of the CPUs associated with each GPU node. Requests should be calculated

accordingly, using a minimum multiplier for CPU/GPU hours equivalent to the CPU/GPU ratio of the hardware. For example, for nodes with 12 cores and 2 GPUs the request per GPU must assume the equivalent use of 6-cores (even if not all will be used). Hence 1 GPU hour = 6 SUs. The proposal should also describe the intended CPU/GPU usage of the simulation approach and also which GPU hardware is being targeted (e.g. the small number of nodes with 7 M2090 GPUs each, nodes with two C2070 GPUs each or nodes with a K10).

Notes on Data Storage requests for gSTAR and swinSTAR:

Both gSTAR and swinSTAR are networked to a 3 Petabyte data store. Reasonable requests for storage are 100 Terabyte or less per project and the data will remain available for three months after the project ends.

3. Pawsey ATHENA: Up to 5000 kSUs

The Pawsey Supercomputing Centre is currently in the process of installing the Advanced Technology Cluster, known now as "Athena", consisting of two emerging technology architectures. These components include an Intel Xeon Phi cluster with a 100 GBps OmniPath interconnect, and a NVIDIA Pascal GPU cluster with a 100 Gbps EDR Infinband interconnect. The two modest size clusters are intended to allow Pawsey researchers to engage with cutting-edge technologies, and inform the eventual capital refresh of the current petascale system. During this call Pawsey is offering 25% of the Athena system (5000 kSUs of CPU time or 4 kSUs of GPU time). The CPU component will use the Intel KNL (64 core chip).
The Athena Early Adopter Program will last for several months starting in June and continue until the end of 2017. However, these dates may vary depending on the duration of commissioning and acceptance testing. It should be noted that as the system will be in pre-production, it may not always be stable or available.

Proposal Form

The proposal form can be found on the ASTAC website:
http://www.astronomyaustralia.org.au/commitees/astac
(Please note that this call is using an updated proposal form)

Please email your completed forms to ahassan@swin.edu.au by the proposal due date.
Proposals are due by 5pm (AEST) Thursday 1st June 2017.

We ask those who are applying for time to continue an existing project to take note of the requirements to report on past usage and to make sure to highlight how the new request will build upon that usage.

User assistance

For assistance with the proposal form, or for more information on the resources available, please contact Dr. Amr Hassan (ahassan@swin.edu.au). Note that Amr may also be contacted for enquiries related to the suitability of code for use on GPUs.

Notes:

- Please note that additional access to HPC facilities for astronomy and astrophysics at NCI is available through the National Computational Merit Allocation Scheme http://ncmas.nci.org.au, and through dedicated shares for the organisational partners of both NCI and Pawsey.
- Also note that Australian astronomers can apply for an account on the Swinburne HPC facility (to access gSTAR or swinSTAR nodes) at any time. A generous amount of CPU and GPU cycles is available through the general access job queue. In particular, if you have not used the facility before it is recommended that you first exercise this option in order to become familiar with the facility and to test/develop your code. More information can be found at: http://supercomputing.swin.edu.au/