

Astronomy Supercomputer Time Allocation Committee

Allocation of time on Australian supercomputing resources

**** The current call for proposals closes at 9am (AEDT) Monday 2nd December, 2013. ****

ASTAC has issued a call for proposals for the use of the following resources for 1st January 2014 to 30th June 2014 (i.e. Quarters 1-2, 2014). This document describes the resources available under the NCI Astronomy Flagship Program and on the GreenII (gSTAR/swinSTAR) supercomputer.

Note that the following program descriptions use 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 1000 kSU to be allocated for Q1-Q2.

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 system such as Raijin at the NCI National Facility. More information on Raijin can be found on the NCI web site:

<http://nci.org.au>.

2. GreenII (gSTAR and swinSTAR): 1700 kSU to be allocated for Q1-2 (1200 kSU prioritised for GPU-based proposals).

gSTAR and swinSTAR are both part of the new 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 Tflops of performance (single precision, ~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 Tflops (single precision, only ~0.1 Tflops 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://astronomy.swin.edu.au/supercomputing/green2/>.

The GPU nodes offer the prospect of fast execution times for suitable purpose-written codes. 1200 kSU is available for GPU-based proposals in Q1-2.

The E5-2660 Intel SandyBridge CPUs in the swinSTAR nodes are the latest available and will be attractive for CPU-based code. 500 kSU is available for CPU-based proposals.

It should be noted that while 1200 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-core/GPU hours equivalent to the CPU-core/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 1.6 Pbyte data store. Reasonable requests for storage are 100 Tbyte or less per project and the data will remain available for three months after the project ends.

Proposal Form

The proposal form can be found on the ASTAC website:
<http://www.astronomyaustralia.org.au/commitees/astac>

Please email your completed forms to mita.brierley@astronomyaustralia.org.au by the proposal due date. Proposals are due by 9am (AEDT) Monday 2nd December 2013.

User assistance

For assistance with the proposal form, or for more information on the resources available, please contact Jon Smillie (jon.smillie@anu.edu.au) or Luke Hodkinson (lhodkins@astro.swin.edu.au). Note that Luke may also be contacted for enquiries related to the suitability of code for use on GPUs.

Future proposals

There will be a further call for proposals around May 2014 for allocations in July - December 2014 on these facilities.

Please note that additional access to HPC facilities for astronomy and astrophysics at the NCI is available through the National Computational Merit Allocation Scheme <http://ncmas.nci.org.au>, and through dedicated shares for the organisational partners of NCI.