

## Great Lakes Consortium for Petascale Computation (GLCPC)

### 2014 Call for Proposals For Allocations on the Blue Waters High Performance Computing System

The Great Lakes Consortium for Petascale Computation (GLCPC) has been allocated 3.5 million node hours (equivalent to approximately 50 Million core hours) annually as part of the Blue Waters project. This allocation provides the GLCPC member institutions with an unprecedented opportunity to advance their programs in computation, data, and visualization intensive research and education. This Call For Proposals (CFP) describes the process for submitting a proposal to the GLCPC Allocations Committee for allocations on the Blue Waters system. Details on the Blue Waters system can be found at: <http://www.ncsa.illinois.edu/BlueWaters/>.

Given the unprecedented scale and innovative architecture of the Blue Waters System, we are seeking proposals that focus on its scale and unique capabilities. Thus, projects that could be completed on one of the other NSF sponsored systems as part of the current XSEDE program are not encouraged for GLCPC Blue Waters Allocations.

The GLCPC is seeking innovative proposals that fall into four categories:

- 1) **Scaling studies:** The scaling of codes which will operate efficiently on large numbers of parallel processors presents a number of challenges. Therefore, projects of particular interest include those that optimize and/or scale community codes to very large scales. Examples include scaling of multilevel parallel applications (MPI+OpenMP), accelerators (CUDA, OpenACC or OpenCL), I/O and Data intensive applications, or novel communication topologies.
- 2) **Multi-GLCPC-institutional projects** addressing focused scientific projects. An example might be a Great Lakes Ecosystems Modeling initiative (Digital Great Lakes).
- 3) **Proposals for applications well-suited for the BW system architecture.**
- 4) **Proposals from non-traditional and underserved communities.**

The GLCPC Allocations Committee anticipates 3-8 projects/allocations annually; consequently, the smallest project is expected to be approximately 320,000 node hours (~ 5 Million core hours), which is roughly the same as dedicated use of a 4 core, 1280 node cluster. We note that applications at this scale will require development efforts as well as different phases, such as: tuning and development; some smaller runs; large "production runs"; and then post processing; but, all will be at scales beyond other available large resources. GLCPC allocation proposals will be accepted through midnight EST **November 3, 2014**. The proposal review process is expected to be complete by early January 2015. Allocations awarded through GLCPC will be available for use beginning April 1, 2015 and will expire one year from time of award.

To make your allocation request, please submit a written proposal (see format below), not to exceed 5 pages (in PDF format) to: <https://www.easychair.org/conferences/?conf=glcpc2014cfp>

**Eligibility:** Only Principal Investigators affiliated with an institutional member of the Great Lakes Consortium for Petascale Computation are eligible to submit a GLCPC allocations proposal. Access to the Blue Waters system will be governed by the Blue Waters Terms of Use: <https://bluewaters.ncsa.illinois.edu/terms-of-use>. Questions about this CFP should be addressed to: [allocations-glcpc@ncsa.illinois.edu](mailto:allocations-glcpc@ncsa.illinois.edu).

**Reporting Requirements:** GLCPC Blue Waters allocations awardees will be responsible for reporting on their progress in utilizing their allocations and describing the impact that access to the Blue Waters system has made on their research. An interim report (6 months into allocation period) and a final report will be required.

**Renewal Requests:** Previous awardees of GLCPC allocations on the Blue Waters system are eligible to make renewal requests but must clearly demonstrate significant progress in using the previous year's allocation and clearly describe the new research that will be made possible by an additional Blue Waters allocation.

September 28, 2014

## **Proposal Content** (not to exceed 5 pages)

**Target Problem:** A description of the specific research question(s) that the resources requested will be used to answer and the scientific and societal impact of the proposed work. Include an explanation of why a petascale resource of the leading-edge capability that Blue Waters represents is necessary to address this research.

**Team Members:** Name, title, affiliation and contact information for each member of requesting project team.

**Description of codes:** Describe the structure of the application codes that you intend to use. These may either currently exist, but might require enhancement, or they may be in development. Please include details about the algorithms involved and the approach that you intend to use to ensure that the code scales effectively on the Blue Waters architecture. Please include descriptions of how your code(s) will use each of the major system elements: the memory hierarchy, the communications network, the computational elements, and the I/O subsystem. Describe how you intend to analyze the output resulting from your use of Blue Waters. **IMPORTANT:** Please describe any run-time libraries or special system software or program development environment features that you will require and the types of graphics support that you would find most useful.

**Porting, testing and scalability plans:** Describe the current state of readiness of the application codes that you intend to use and your plans for developing these to the point where they are ready to run in production mode on the Blue Waters system. Estimate the type of consulting help that you will need to port and scale your application(s) to the Blue Waters system.

**Resources Required:** Describe the Blue Waters resources required to complete research on the Target Problem. This description should include the number of system nodes needed for your runs, the anticipated actual memory usage, the expected numbers of each major class of arithmetic and logical operation, the expected numbers of local and remote memory accesses, the total number of node-hours required, the anticipated input and output requirements, the amount of data that you anticipate transferring to or from the Blue Waters enclave, the amount and type of storage required and any other system resource needs that you anticipate.

**Support Plan:** Allocations will be made with the understanding that the support model is explicitly targeted for experienced, advanced users. NCSA does not have the staff to provide a broad range of support or introductory services. Proposals must describe the institutional structure that will be used to support the proposed work. Institutional support staff will be responsible for triage of user problems and basic user support. Blue Waters experts will help train the support staff at the proposing institutions, and will also help triage problems.

**Source(s) of funding:** Please identify the source(s), amount(s) and duration of existing funding that is supporting the development of your petascale application. If not currently funded, please describe how you intend to support any required development work.

## **Additional Required Documents** (not included in 5 page proposal limit):

- Proposal abstract for public posting
- NSF formatted 2 page bios of project team PI and co-PIs
- References cited