

# Northwest Indiana Computational Grid

## Request for Proposals Spring '06

The Northwest Indiana Computational Grid (NWICG) is a consortium of researchers and educators at Purdue University-West Lafayette (Purdue), Purdue University-Calumet (Calumet), and the University of Notre Dame, that couples mutual interests among the three campuses in computational research initiatives, builds a cyber-infrastructure that supports the solution of break-through level problems, and enables continuing world-class advances in the underlying technologies of high performance computing. Funded through DOE in collaboration with Argonne National Labs, the NWICG is seeking proposals from researchers and educators of the partner institutions that either enhance ongoing research in ways not currently possible, or stimulate new lines of research that are only possible with resources such as NWICG may provide. Expected topics include both those that may use grid resources to perform research, or those that measure, modify, or extend facilities available on the grid in novel ways. Proposals that initiate or increase collaboration among the partner institutions are particularly welcome.

Proposals seeking support from the consortium should be of high quality and will be peer evaluated considering a number of criteria. The criteria are used to determine the quality and alignment of the proposal with the consortium's mission. In particular, proposals will be evaluated using the following primary metrics; impact on the field and potential for recognition in the wider computational grid community, cycle-driven work or work with massive data and high bandwidth requirements, ability to leverage with other funding, development of novel grid-specific infrastructure with good applicability potential, work force development, educational activities, economic development potential, collaboration across the consortium partner institutions, and interdisciplinary nature of the research.

The proposals should consider anticipated usage scenarios that develop, engage and exercise the grid resources in a variety of ways. Such scenarios extend to various degrees into resource utilization, novel applications, and system platform/service delivery. From a resource utilization perspective, the possibilities include:

- Compute intensive applications that would benefit from one or more tightly coupled high performance computing systems.
- High-throughput applications that need a large number of compute cycles, but not necessarily in a tightly coupled mode.
- Applications in distributed computation that need a test bed.
- Data-intensive applications that need access to very large storage, for analysis and archival.
- High-end visualization facilities, for viewing data obtained from computations or observations.
- High-speed networking, to enable fast access to large data sets, to link compute engines, and to do collaborative visualization.

On the infrastructure/middleware level, proposed work could target platform analysis and development, such as

- Measurements of performance for realistic benchmarks and
- Development of services such as geographically distributed, low-latency, high-bandwidth storage repositories that are resilient to failure and secure.
- Job scheduling issues that consider gang scheduling of work flows such as moving a data set to a computational resource, processing it, and then moving the resulting output.
- Real-time visualization

Specific application topics of work that come to mind include, but are not limited to,

- Science gateways for specific application domains, such as computational design optimization.
- Power grid modeling and control requiring distributed computing to monitor sensor networks and predict future system states.
- Life sciences applications such as bio-informatics and biometrics.
- Massive visualization tasks arising in ultra-high resolution GIS, homeland security, nano structures, and more.

For other examples, see also the research presentations at the first two workshops of the NWICG at [www.nwicgrid.org](http://www.nwicgrid.org). As the project is in an early stage, we expect to be able to fund only a few proposals at this time. Proposals that are submitted but not accepted may be retained for later consideration.

## **Types of Support, Submission, and Application Procedures**

Faculty at the partner institutions may submit proposals. Support requests may be for allocation of the resources acquired by the consortium, primarily of hardware resources but also including support by staff hired by the consortium for that purpose. Limited support for graduate students may also be available. Funding is limited during the first year with increased support anticipated in Fall of '06.

When requesting access to hardware resources, a description should be included that explains any license restrictions and limited access/distribution considerations of data that may be part of the proposed work.

Interested PIs should submit electronically a two-page proposal with a budget to [submissions@nwicgrid.org](mailto:submissions@nwicgrid.org). Proposals will be peer-evaluated by the science committee of the NWICG, a body constituted by the three partners with help from the Computing Research Institute in West Lafayette, the Center for Research Computing in Notre Dame, and the office of Vice Chancellor for research and Professional Development in Calumet. Final awards will be made by the Steering Committee of the NWICG.

Proposals submitted should be for the Summer of 2006. Proposals received by March 1, 2006, will be given priority; later submissions will be considered assuming resources are available. Questions from Notre Dame researchers can be submitted to Dewitt Latimer, Interim Director for the Center for Research Computing; [dewitt@nd.edu](mailto:dewitt@nd.edu)