Office of Energy Research

Notice 96-14
High Performance Computing and Communications Grand Challenge Applications

Department of Energy
Office of Energy Research

Energy Research Financial Assistance Program Notice 96-14;
High Performance Computing and Communications Grand Challenge Applications

AGENCY: U. S. Department of Energy (DOE)

ACTION: Notice inviting grant applications

SUMMARY: The staff of the Mathematical, Information, and Computational Sciences (MICS) Division of the Office of Computational and Technology Research (OCTR), Office of Energy Research (ER), U. S. Department of Energy (DOE) announces its interest in receiving grant applications for research grants for High Performance Computing and Communications Grand Challenge Applications.

DATES: Formal applications submitted in response to this notice must be received not later than 4:30 p.m. E.D.T., June 15, 1996, to permit timely consideration for award early in fiscal year 1997.

ADDRESSES: Formal applications, referencing Program Notice 96-14, should be forwarded to: U. S. Department of Energy, Office of Energy Research, Grants and Contracts Division, ER-64, 19901 Germantown Road, Germantown, Maryland 20874-1290, Attn: Program Notice 96-14. The above address also must be used when submitting formal applications by U. S. Postal Service Express Mail, any commercial mail delivery service, or when handcarried by the applicant.

FOR FURTHER INFORMATION CONTACT: Dr. Walter C. Ermler, Office of Energy Research, U. S.. Department of Energy, OCTR/MICS, ER-31, 19901 Germantown Road, Germantown, MD 20874-1290, Tel: (301) 903-5800.

SUPPLEMENTARY INFORMATION: High Performance Computing and Communications (HPCC) Grand Challenge Applications (GCAs) address computation-intensive fundamental problems in science and engineering whose solutions can be advanced by applying HPCC technologies and resources. This solicitation constitutes Phase II of the DOE HPCC GCAs program. DOE GCAs will be restricted to DOE mission areas and relevant research programs of the DOE Office of Energy Research.

Each of the GCA projects will be comprised of two components, Research and Infrastructure. The three-year program for 3-6 GCAs will designate a total of $3-6M per year, subject to the availability of FY 1997 funds, to a scientific or engineering Research component which will be accompanied by an Infrastructure component that will provide the required computational, storage, networking, and software support. The value of this enabling Infrastructure component is anticipated to be a total of $6-12M per year. Support for the Research component will be provided to the sponsoring institution(s) of the PI(s) while the funding of the Infrastructure component will be allocated directly to the computing centers(s) providing the enabling computational support. This requires that the GCAs are substantial collaborations between the PI(s) and the professional staff at the computing center(s) at which the computational research is to be carried out and that grant applications reflect this structure. Furthermore, applications must describe in detail the requirements from the computing centers housing the computational platforms to be used for the research.

The OCTR/MICS-supported platforms are operated in the following computing centers: the Advanced Computing Laboratory of Los Alamos National Laboratory, the Center for Computational Sciences of Oak Ridge National Laboratory, the Mathematics and Computer Sciences Division of Argonne National Laboratory, and the National Energy Research Supercomputer Center of Lawrence Berkeley National Laboratory. While use of resources housed at facilities operated by other government agencies, academia, or private industry are acceptable, at least one of the platforms for carrying out the proposed research must be located at a computing center supported by OCTR/MICS. Furthermore, Infrastructure funds can only be allocated to one or more of the four OCTR/MICS-supported facilities. Information concerning platforms at these centers may be found through URL at the following: http://www.er.doe.gov/production/octr/mics/index.html

Applications will be subjected to formal merit review (peer review) and will be evaluated against the following evaluation criteria listed in descending order of importance as codified for review of applications from the academic and industrial sectors in 10 CFR part 605:
1. Scientific and/or Technical Merit of the Project
2. Appropriateness of the Proposed Method or Approach
3. Competency of Applicant's Personnel and Adequacy of Proposed Resources
4. Reasonableness and Appropriateness of the Proposed Budget

Within the Scientific and/or Technical Merit criterion, above, the following subcriteria, listed in priority order, will be used for evaluation purposes:
i. Fundamental Significance: A fundamental science or engineering problem that has potential economic, societal, and/or scientific impact and that can be advanced by applying high performance computing resources.
ii. DOE Mission: The problem is significant to the missions of the DOE. The pertinent DOE Science or Engineering program in partnership with OCTR/MICS staff must validate the merit of the applications with regard to this criterion.
iii. HPCC Goals: The project is consistent with the goals of the Federal interagency HPCC program.
iv. Enabling Technologies: Rapid progress in software/hardware technologies should enable a substantial advance on the problem within the next few years. This criterion must be validated by

OCTR/MICS staff in partnership with the pertinent DOE Science or Engineering Program.
v. Interdisciplinary Approach: An interdisciplinary approach involving scientists, engineers, mathematicians, and computer/computational scientists is strongly required.
vi. Support Leveraging: Funding leverage for the GCA provided by the partners - DOE Program Offices, other agencies, or institutions - will constitute the most sincere form of validation.
vii. Technology Leveraging: Probable advances in enabling software or hardware technologies developed by the proposed GCA that benefit other GCAs will be treated favorably, as will GCAs which use advanced software development frameworks.
viii. Computer Resources: The application should indicate the appropriateness and adequacy of the Infrastructure-component resources for the GCA (architectures, peripheral storage facilities, networking, support staff, etc.).
ix. Multiple Platforms: Applications will also be evaluated based on the portability and extensibility of any system and/or software development technology proposed. For this reason, applicants are encouraged to involve more than one type of computing platform in their research project.

Within the Appropriateness of the Proposed Method or Approach criterion, above, special attention will be given to how the collaboration will be managed and to how results of the project are to be integrated into substantial advances in the field and the enabling computational technology.

External peer reviewers will be selected with regard to both their scientific expertise and the absence of conflict- of-interest issues. Non-federal reviewers will be used, and submission of an application constitutes agreement that this is acceptable to the investigator(s) and the computing center(s).

Details of the DOE HPCC program and its Phase I GCA projects are given in the following publication available from the U. S. Department of Energy, Office of Energy Research, OCTR/MICS, ER-31, 19901 Germantown Road, Germantown, MD 20874-1290, Tel: (301) 903-5800: The DOE Program in High Performance Computing and Communications (on-line version URL http://www.er.doe.gov/production/octr/mics/wb_95/wb_95.html).

The Federal interagency HPCC program is described in the following publications available from the National Coordination Office for High Performance Computing and Communications, Suite 665, 4201 Wilson Boulevard, Arlington, VA 22230, Tel: (703) 306-4722: High Performance Computing and Communications: Foundation for America s Information Future (on-line version available through URL http://www.hpcc.gov/blue96/index.html), High Performance Computing and Communications FY 1996 Implementation Plan (on-line version URL http://www.hpcc.gov/./imp96/index.html).

Information about the development and submission of applications, eligibility, limitations, evaluation, selection processes, and other policies and procedures may be found in 10 CFR Part 605, and in the Application Guide for the Office of Energy Research Financial Assistance Program. The Application Guide is available from the U. S. Department of Energy, Office of Energy Research, OCTR/MICS, ER-31, 19901 Germantown Road, Germantown, MD 20874-1290. Telephone requests may be made by calling (301) 903-5800. Electronic access to ER's

Financial Assistance Guide is possible via the Internet using the following e-mail address: http://www.er.doe.gov/production/grants/grants.html. In addition to the formal application as described in the above publications, the staff of OCTR/MICS requires that a two-page summary be prepared by the Research component PI(s). The format and content of the summary is as follows:

Title of the GCA

Designated scientific leader

The single point of contact who represents the GCA team.

Home institution of the GCA

Not necessarily the proposing institution, but the organization/intellectual home institution.

Abstract of the proposed project

Not to duplicate criteria discussion below.

Participants, their institutions and addresses

Include E-mail addresses.

Partner DOE Program(s) and Program Office contacts

Reference participants by number if appropriate.

Address each of the nine criteria

Fundamental Significance, DOE Mission, HPCC Goals, Enabling Technologies, Interdisciplinary Approach, Support Leveraging, Technology Leveraging, Computer Resources, Multiple Platforms.

Approach to project integration

How the research collaboration will be managed and the resulting work integrated into a substantial advance for the research and the enabling computational technology.

Resource summary projections for FY 1997-FY 2000

Budget totals of Personnel, Equipment, etc. separating Personnel, Operating, and Capital (if applicable) by year. Computational resources needed (system and time). The totals should be given for the two components: Research and Infrastructure.

Project summary

Brief (less than one page) project summary for each participating (Research component) institution and computing center (Infrastructure component). Participants are to be identified by their role in the project. A resource summary projection is also required that includes whether subcontracts or direct funding are being sought.

The Catalog of Federal Domestic Assistance Number for this program is 81.049, and the solicitation control number is ERFAP 10 CFR Part 605.

Issued in Washington, DC.

John Rodney Clark
Associate Director
for Resource Management
Office of Energy Research

Published in the Federal Register April 5, 1996, Vol. 61, No. 67,
pages 15235-15236.