

associated with the preparation or submission of applications if an award is not made.

(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, on November 3, 2003.

**John Rodney Clark,**

*Associate Director of Science for Resource Management.*

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## DEPARTMENT OF ENERGY

### Office of Science Financial Assistance Program Notice DE-FG01-04ER04-03; High-Performance Network Research: Scientific Discovery Through Advanced Computing (SciDAC) and Mathematical, Informational, and Computational Sciences (MICS)

**AGENCY:** Department of Energy.

**ACTION:** Notice inviting grant applications.

**SUMMARY:** The Office of Advanced Scientific Computing Research (OASCR) of the Office of Science (SC), in the U.S. Department of Energy (DOE), hereby announces its interest in receiving grant applications for projects in the high-performance network research program. Opportunities exist for research with a primary focus on integrated experimental networks to support high-impact applications in the Scientific Discovery through Advanced Computing (SciDAC) program and for ultra high-speed network technologies under the Mathematical, Computational, and Information Sciences (MICS) Division. More specific information on this solicitation is outlined in the supplementary information section below.

**DATES:** Potential applicants are strongly encouraged to submit a brief preapplication. All preapplications, referencing Program Notice DE-FG01-04ER04-03, should be received by DOE by 4:30 p.m., e.s.t., December 15, 2003. A response to the preapplications encouraging or discouraging a formal application generally will be communicated to the applicant within 14 days of receipt. The deadline for receipt of formal applications is 4:30 p.m., e.s.t., February 25, 2004, in order to be accepted for merit review and to permit timely consideration for award in Fiscal Year 2004.

**ADDRESSES:** All preapplications referencing Program Notice DE-FG0104ER04-03, should be sent

electronically to Dr. Thomas D. Ndousse, Mathematical, Informational, and Computational Sciences Division, Germantown Bldg./SC-31, Office of Science, U.S. Department of Energy, 1000 Independence Avenue, SW., Washington, DC 20858-1290. Email: [tndousse@sc.doe.gov](mailto:tndousse@sc.doe.gov), Phone: 301-903-9960, Fax: 301-903-7774.

The preapplications should consist of two to three pages of narrative describing the research objectives and technical approach(es). Preapplications will be reviewed relative to the scope and research needs of the ASCR ultra high-speed networks for high-end scientific computing, as outlined in the summary paragraph and in the Supplementary Information. The preapplication should identify, on the cover sheet, the title of the project, the institution, principal investigator name, telephone, fax, and e-mail address. The focus element (SciDAC or MICS) for the preapplication should also be clearly identified. A response to each preapplication discussing the potential programmatic relevance of a formal application will be communicated to the Principal Investigator within 7 to 14 days of receipt.

Formal applications in response to this solicitation are to be electronically submitted by an authorized institutional business official through DOE's Industry Interactive Procurement System (IIPS) at: <http://e-center.doe.gov/>. IIPS provides for the posting of solicitations and receipt of applications in a paperless environment via the Internet. In order to submit applications through IIPS your business official will need to register at the IIPS website. It is suggested that this registration be completed several days prior to the date on which you plan to submit the formal application. The Office of Science will include attachments as part of this notice that provide the appropriate forms in PDF fillable format that are to be submitted through IIPS. IIPS offers the option of submitting multiple files—please limit submissions to only one file within the volume if possible, with a maximum of no more than four files. Color images should be submitted in IIPS as a separate file in PDF format and identified as such. These images should be kept to a minimum due to the limitations of reproducing them. They should be numbered and referred to in the body of the technical scientific proposal as Color image 1, Color image 2, etc. Questions regarding the operation of IIPS may be e-mailed to the IIPS Help Desk at: [helpdesk@pr.doe.gov](mailto:helpdesk@pr.doe.gov) or you may call the help desk at: (800) 683-0751. Further information on the use of IIPS by the Office of Science is available

at: <http://www.sc.doe.gov/production/grants/grants.html>.

If you are unable to submit the application through IIPS, please contact the Grants and Contracts Division, Office of Science at: (301) 903-5212 or (301) 903-3604, in order to gain assistance for submission through IIPS or to receive special approval and instruction on how to submit printed applications.

**SUPPLEMENTARY INFORMATION:** Emerging large-scale experiments in many areas of science, such as high-energy physics, nuclear physics, climate modeling, biological sciences, etc., are anticipated to generate up to several Petabytes of data that will be transferred to geographically distant terascale computing facilities for analysis. The problems of efficient transfer of Petabyte-scale data, remote visualization of the resulting analysis, remote access to complex scientific instruments, and efficient large-scale scientific collaboration over today's networks all present serious technical challenges to networking and science communities. Addressing these challenges calls for a new generation of highly scalable transport mechanisms that can deliver and sustain multi-Gbps to high-end scientific applications; agile networking technologies that will make bandwidth on-demand possible; innovative scalable cyber security systems that operate efficiently and effectively at ultra high-speed (10 Gbps and beyond); intelligent network services that enable scientists to use network infrastructures with ease. These components are the critical building blocks of a new generation of ultra high-speed networks for DOE high-impact science applications.

The design of ultra high-speed networks that are effectively coupled distributed high-impact science applications is especially challenging because existing widely-deployed, low-speed network technologies do not perform well at ultra high-speeds. For example, transport protocols, such as the TCP and UDP stacks, intrusion detection systems, network interface cards, network measurement tools, firewalls, and the related middleware perform poorly at ultra high-speed.

Research is needed to enhance the performance of existing components and in some cases to develop radically new components that work effectively and efficiently at ultra high-speed. In addition, understanding how these components can be integrated to develop production-quality, ultra high-speed networks that can deliver end-to-end multi-Gigabits/sec to distributed