

**FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT**



**U.S. Department of Energy
Office of Science
Advanced Scientific Computing Research**

**Funding Opportunity Number: DE-PS02-07ER07-23
Announcement Type: Initial
CFDA Number: 81.049**

Issue Date: March 7, 2007

**Pre-Application Due Date: April 6, 2007, 4:30 PM Eastern Time
(Preapplications are Required)**

Application Due Date: June 11, 2007, 8:00 PM Eastern Time

NOTE: REQUIREMENTS FOR GRANTS.GOV

Where to Submit: Applications must be submitted through Grants.gov to be considered for award. You cannot submit an application through Grants.gov unless you are registered. Please read the registration requirements carefully and start the process immediately. Remember you have to update your CCR registration annually. If you have any questions about your registration, you should contact the Grants.gov Helpdesk at 1-800-518-4726 to verify that you are still registered in Grants.gov.

Registration Requirements: There are several one-time actions you must complete in order to submit an application through Grants.gov (e.g., obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number, register with the Central Contract Registry (CCR), register with the credential provider, and register with Grants.gov). See <http://www.grants.gov/GetStarted>. Use the Grants.gov Organization Registration Checklist at <http://www.grants.gov/assets/OrganizationRegCheck.pdf> to guide you through the process. Designating an E-Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in the CCR registration process. Applicants, who are not registered with CCR and Grants.gov, should allow at least 21 days to complete these requirements. It is suggested that the process be started as soon as possible.

IMPORTANT NOTICE TO POTENTIAL APPLICANTS: When you have completed the process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e. Grants.gov registration).

Questions: Questions relating to the registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov. Part VII of this announcement explains how to submit other questions to the Department of Energy (DOE).

Application Receipt Notices: After an application is submitted, the Authorized Organization Representative (AOR) will receive a series of five e-mails. It is extremely important that the AOR watch for and save each of the e-mails. It may take up to two (2) business days from application submission to receipt of e-mail Number 2. When the AOR receives e-mail Number 5, it is their responsibility to follow the instructions in the e-mail to logon to IIPS and verify that their application was received by DOE. The titles of the five e-mails are:

- Number 1 – Grants.gov Submission Receipt Number
- Number 2 – Grants.gov Submission Validation Receipt for Application Number
- Number 3 – Grants.gov Grantor Agency Retrieval Receipt for Application Number
- Number 4 – Grants.gov Agency Tracking Number Assignment for Application Number
- Number 5 – DOE e-Center Grant Application Received

The last e-mail will contain instructions for the AOR to register with the DOE e-Center. If the AOR is already registered with the DOE e-Center, the title of the last e-mail changes to:

- Number 5 – DOE e-Center Grant Application Received and Matched

This e-mail will contain the direct link to the application in IIPS. The AOR will need to enter their DOE e-Center user id and password to access the application.

VERY IMPORTANT – Download PureEdge Viewer: In order to download the application package, you will need to install PureEdge Viewer. This small, free program will allow you to access, complete, and submit applications electronically and securely. For a free version of the software, visit the following web site: <http://www.grants.gov/DownloadViewer>.

TABLE OF CONTENTS

PART I – FUNDING OPPORTUNITY DESCRIPTION

PART II – AWARD INFORMATION

- A. Type of Award Instrument**
- B. Estimated Funding**
- C. Maximum and Minimum Award Size**
- D. Expected Number of Awards**
- E. Anticipated Award Size**
- F. Period of Performance**
- G. Type of Application**

PART III – ELIGIBILITY INFORMATION

- A. Eligible Applicants**
- B. Cost Sharing or Matching**
- C. Other Eligibility Requirements**

PART IV – APPLICATION AND SUBMISSION INFORMATION

- A. Address to Request Application Package**
- B. Letter of Intent and Pre-Application**
- C. Content and Form of Application**
- D. Submissions from Successful Applicants**
- E. Submission Dates and Times**
- F. Intergovernmental Review**
- G. Funding Restrictions**
- H. Other Submission and Registration Requirements**

PART V – APPLICATION REVIEW INFORMATION

- A. Criteria**
- B. Review and Selection Process**
- C. Anticipated Notice of Selection and Award Dates**

PART VI – AWARD ADMINISTRATION INFORMATION

- A. Award Notices**
- B. Administrative and National Policy Requirements**
- C. Reporting**

PART VII – QUESTIONS/AGENCY CONTACTS

- A. Questions**
- B. Agency Contacts**

PART VIII – OTHER INFORMATION

- A. Modifications**
- B. Government Right to Reject or Negotiate**
- C. Commitment of Public Funds**
- D. Proprietary Application Information**
- E. Evaluation and Administration by Non-Federal Personnel**

- F. Intellectual Property Developed under this Program**
- G. Notice of Right to Request Patent Waiver**
- H. Notice Regarding Eligible/Ineligible Activities**

PART I – FUNDING OPPORTUNITY DESCRIPTION

The technical contact/program manager for the FASTOS program is:

Dr. Fred Johnson

Telephone: (301) 903-5800

Fax: (301) 903-7774

E-mail: fjohnson@er.doe.gov

The Office of Advanced Scientific Computing Research (ASCR) of the Office of Science (SC), U.S. Department of Energy (DOE), hereby announces its interest in receiving applications for research grants in Operating and Runtime Systems for Extreme Scale Scientific Computation (FASTOS). This announcement is focused on research and development of operating and runtime systems which enable the effective management and use of extreme-scale systems (petascale and beyond) for scientific computation. The overall goal of this announcement is to stimulate research and development related to operating and runtime systems for petascale systems the in 2010 to 2015 timeframe. It is likely that these systems will include a combination of commodity and custom components, with different systems reflecting different degrees of customization. Operating and runtime systems research must be driven from the needs of current and future applications, and the primary focus is on supporting the needs of existing and anticipated SC and other DOE applications. An ultimate goal would be the development of a unified operating and runtime system that could fully support and exploit petascale and beyond systems and autonomously adapt to meet specific application needs for performance, functionality, security, and fault tolerance. The activities supported by this notice may be a combination of basic research, development, prototyping, and testing. Partnerships among universities, National Laboratories, and industry are encouraged.

Operating and runtime systems provide mechanisms to manage system hardware and software resources for the efficient execution of large scale scientific applications. They are essential to the success of both large scale systems and complex applications. By the end of this decade petascale computers with thousands of times more computational power than any in current use will be vital tools for expanding the frontiers of science and for addressing vital National priorities. These systems will have tens to hundreds of thousands of processors, an unprecedented level of complexity, and will require significant new levels of scalability and fault management. The overwhelming size and complexity of such systems poses deep technical challenges that must be overcome to fully exploit their potential for scientific discovery. Applications require multiple services from OS/R layers, including: resource management and scheduling, fault-management (detection, prediction, recovery, and reconfiguration), configuration management, and file systems access and management. Current and future large

scale parallel systems require that such services be implemented in a fast and scalable manner so that the OS/R does not become a performance bottleneck. The current trend in large scale scientific systems is to leverage operating systems developed for other areas of computing – operating systems that were not specifically designed for large scale, parallel computing platforms. Unix, Linux and other Unix derivatives are the most popular OS's in use for high end scientific computing, and these all reflect a technological heritage nearly 30-years old with few fundamental mechanisms to support parallel systems.

Example Research Topics

Operating and runtime systems provide the glue that bind running applications to hardware. The research activities supported by this activity need to bridge the gap between new languages and/or programming models and next-generation hardware, including interactions with novel architectures. Consequently, there are a wide variety of research topics that are appropriate for this effort. A brief listing of candidate topics is provided below, but research in other relevant areas and combinations of areas is encouraged:

Virtualization. Virtualization is expected to play an increasingly important role in the deployment of large scale systems, enabling multiple operating systems on a single platform and application specific operating systems. Virtualization includes the development and use of hypervisors, virtual machine monitors, and application/runtime virtualization for HPC systems. Specific topics of interest include: identification and quantification of problems with current hypervisors in HPC systems, novel uses of hypervisors in HPC systems (development, porting, etc), support for fault handling, better support for custom hardware, and lightweight mechanisms for virtual resources.

Fault Handling. As the number of components in a system increase from tens to hundreds of thousands, these systems will have significantly reduced mean time between interrupt (MTI). Mechanisms to support application resiliency in the face of hardware faults are needed to support long running applications. Specific topics of interest include: tradeoffs associated with handling failures at different layers (application, runtime, OS); understanding and identifying sources of faults; approaches to proactive fault handling; fault tolerance for alternate (non-MPI) programming models; languages/APIs for the bi-directional communication of fault information between layers (e.g., between the application and runtime layers); quantification of scalability issues; automatic, transparent, and efficient checkpoint/restart; and checkpointing when disks are far away.

OS Noise/Interference. Operating system interference or noise due to asynchronous overhead needed to implement system services, has been shown to have a significant impact on application performance on very large scale systems. Measurement and understanding the impact of OS interference on application performance at scale will be critical to the successful deployment of very large scale systems. Specific topics of interest include: OS design strategies for dealing with OS noise (e.g., implementations of critical services that minimize related noise and alternatives for timeouts and/or periodic service requirements); hardware features to control the impact of noise (e.g., hardware support for low overhead barriers); strategies to mitigate the impact of OS noise (e.g., exploiting asynchrony).

Exposing Resources. Bidirectional APIs to expose system information (performance counters) and to select implementations are critical for application level adaptability (need information about what is being used and may need to select alternate implementations). Specific topics of interest include: hooks for controlling resources; interfaces to allow code to query hardware characteristics; exposing communication related resources.

Resource Management. Managing the local and global resources provided by a computing system is a fundamental responsibility of any operating system, and exploration of policies and mechanisms for resource management is especially critical for petascale systems. Specific topics of interest include: local resource management (memory management, processor scheduling (multi-core), and communication support); interfaces between local and external components (gang scheduling, virtual memory reservations and queries); support for alternate (non-MPI) programming models (e.g., UPC); OS service coordination (load balancing at scale, global memory management, topology aware mapping of work- and data-units); heterogeneous resource management (HW and SW); and power management.

Adaptability. The ability of operating and runtime systems to change their behaviors based on application needs to improve performance or tolerate faults needed to support the use of petascale systems. Specific topics of interest include: measurement and strategies to support adaptation; understanding and exploiting application phases; adapting collective communication components; and APIs to expose resource performance models and information.

Performance Measurement. Petascale systems will require models and tools to measure system performance, including hooks for application level performance monitoring; tools to measure runtime/OS performance; performance models (define what needs to be measured); and scalability.

System Management/Administration. Several issues related to overall system administration need to be addressed, including: usage models (space/time sharing); flexible space-sharing; changing processors allocated to running jobs; single system image issues to ease system management number of system administrators should not scale with the size of the system; node allocation; power management; software distribution; and RAS and RAS interfaces.

Parallel I/O: Efficient communication with external storage servers and parallel file systems is an essential component of a petascale system. Topics of interest include: support for high performance access to external servers, efficient, scalable I/O call forwarding, portable I/O models which support diverse storage instantiations, and parallel file systems.

Community building

An important goal of this notice is to foster the development of an active research community in operating systems and runtime environments for high end systems. In order to meet this goal the following are mandatory requirements for awardees:

- All developed code must be released under the most permissive open source license possible. This is to enable other researchers and vendors to build upon research successes with a minimum of intellectual property issues.

- Each research team should plan to send representatives to annual or semi-annual PI meetings and give presentations on the status and promise of their research. Meeting attendees will include invited participants from other relevant research communities, including the Linux community. Objectives of these meetings are to foster a sense of community and serve as a venue for exchange of information. These meetings will also serve as a means to exchange information on complementary programs including the DARPA HPCS program, NNSA ASC program and DOE/SC SciDAC program.

Testbed access

Applications should provide a plan for utilizing leadership class systems at Oak Ridge National Laboratory and Argonne National Laboratory and to systems at the National Energy Research Scientific Computing Center (NERSC) at Lawrence Berkeley National Laboratory for the purpose of software testing at scale. Each application should contain a section which discusses the characteristics of the test environments necessary for the research and identify the time frames in which specific testbed support will be required. Only a relatively limited amount of testing time will be available on these systems, and the individual testing plans will be used to develop an overall test plan for the FASTOS program.

References

FASTOS forum:

<http://www.cs.unm.edu/~fastos>

Federal Plan for High-End Computing:

http://www.nitrd.gov/pubs/2004_hecrf/20040702_hecrf.pdf

PART II – AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT.

DOE anticipates awarding grants under this program announcement.

B. ESTIMATED FUNDING.

It is anticipated that up to \$3 million annually will be available for multiple awards for this program. Awards are planned to be made in Fiscal Year 2008, and applications may request project support for up to three years. All awards are contingent on the availability of funds and programmatic needs. Annual budgets for successful projects are expected to range from \$500,000 to \$1,000,000 per project although smaller projects of exceptional merit may be considered. Annual budgets may increase in the out-years but should remain within the overall annual maximum guidance.

C. MAXIMUM AND MINIMUM AWARD SIZE.

See B. Estimated Funding section above.

D. EXPECTED NUMBER OF AWARDS.

See B. Estimated Funding section above.

E. ANTICIPATED AWARD SIZE.

See B. Estimated Funding section above.

F. PERIOD OF PERFORMANCE.

See B. Estimated Funding section above.

G. TYPE OF APPLICATION.

N/A

PART III - ELIGIBILITY INFORMATION

A. ELIGIBLE APPLICANTS.

All types of entities are eligible to apply, except other Federal agencies, Federally Funded Research and Development Center (FFRDC) Contractors, and nonprofit organizations described in section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995.

B. COST SHARING

Cost sharing is not required.

C. OTHER ELIGIBILITY REQUIREMENTS.

N/A

PART IV – APPLICATION AND SUBMISSION INFORMATION

A. ADDRESS TO REQUEST APPLICATION PACKAGE.

Application forms and instructions are available at Grants.gov. To access these materials, go to <http://www.grants.gov>, select “Apply for Grants,” and then select “Download Application Package.” Enter the CFDA and/or the funding opportunity number located on the cover of this announcement and then follow the prompts to download the application package. **NOTE:** You will not be able to download the Application Package unless you have installed PureEdge Viewer (See: <http://www.grants.gov/DownloadViewer>).

B. LETTER OF INTENT AND PRE-APPLICATION.

1. Letter of Intent.

Letters of Intent are not required.

2. Preapplication.

Potential applicants are **required** to submit a two-page preapplication by email to fjohnsonr@ascr.doe.gov. Preapplications must be received by **April 6, 2007, 4:30 p.m., Eastern Time**. The subject line of the email should be: "**FASTOS Preapplication**". The preapplication should be a Word file attached to the email, having 1 inch margins when printed. No FAX or mail submission of preapplications will be accepted.

Preapplications will be reviewed for conformance with the guidelines and technical areas specified in this announcement. A response to preapplications encouraging or discouraging formal applications will be communicated to the applicants by April 13, 2007. Applicants who have not received a response regarding the status of their preapplication by this date are responsible for contacting the program to confirm their status.

Preapplications should consist of no more than two pages total. This narrative should give the project title and describe the research objectives, the technical approach(s), and all proposed team members and their expertise. It should also include a rough estimate of the planned budget request. The intent in requesting a preapplication is to save the time and effort of applicants in preparing and submitting a formal project application that may be inappropriate for the program. Preapplications also assist ASCR in planning the peer review process and the selection of potential reviewers for the application. **Formal applications will be accepted only from preapplicants encouraged to submit a formal application.**

SC's preapplication policy can be found on SC's Grants and Contracts Web Site at: <http://www.science.doe.gov/grants/preapp.html>. Please contact Dr. Fred Johnson at (301) 903-5800, for any questions related to this announcement.

C. CONTENT AND FORM OF APPLICATION – SF 424 (R&R)

You must complete the mandatory forms and any applicable optional forms (e.g., SF-LLL-Disclosure of Lobbying Activities) in accordance with the instructions on the forms and the additional instructions below. **Files that are attached to the forms must be in Adobe Portable Document Format (PDF) unless otherwise specified in this announcement.**

1. SF 424 (R&R).

Complete this form first to populate data in other forms. Complete all the required fields in accordance with the pop-up instructions on the form. To activate the instructions, turn on the “Help Mode” (Icon with the pointer and question mark at the top of the form). The list of certifications and assurances referenced in Field 18 can be found on the Applicant and Recipient Page at <http://grants.pr.doe.gov>, under Certifications and Assurances.

2. RESEARCH AND RELATED Other Project Information.

Complete questions 1 through 5 and attach files. The files must comply with the following instructions:

Project Summary/Abstract (Field 6 on the Form)

The project summary/abstract must contain a summary of the proposed activity suitable for dissemination to the public. It should be a self-contained document that identifies the name of the applicant, the project director/principal investigator(s), the project title, the objectives of the project, the hypotheses to be tested, the proposed experimental design, the names of **all investigators** and their affiliations, and the potential impact of the project to DOE (i.e., benefits, outcomes). This document must not include any proprietary or sensitive business information as the Department may make it available to the public. The project summary must not exceed 1 page when printed using standard 8.5” by 11” paper with 1” margins (top, bottom, left and right) with font not smaller than 11 point. To attach a Project Summary/Abstract, click “Add Attachment.”

Project Narrative (Field 7 on the form)

The project narrative must not exceed 20 pages, including charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard 8.5” by 11” paper with 1 inch margins (top, bottom, left, and right). **EVALUATORS WILL ONLY REVIEW THE NUMBER OF PAGES SPECIFIED IN THE PRECEDING SENTENCE.** The font must not be smaller than 11 point. Do not include any Internet addresses (URLs) that provide information necessary to review the application, because the information contained in these sites will not be reviewed. See Part VIII.D for instructions on how to mark proprietary application information. To attach a Project Narrative, click “Add Attachment.”

The first page of your narrative must include the following information (this page will not count in the project narrative page limitation):

Applicant/Institution:
Street Address/City/State/Zip:
Principal Investigator:
Address:
Telephone Number:
Email:
Funding Opportunity Announcement Number: DE-PS02-07ER07-18
DOE/Office of Science Program Office:
DOE/Office of Science Program Office Technical Contact:
DOE Grant Number (if Renewal or Supplemental Application):

Is this a Collaboration? If yes, please list ALL Collaborating Institutions/PIs* and indicate which ones will also be submitting applications.

* *Note that collaborating applications must be submitted separately.*

Project Objectives.

This section should provide a clear, concise statement of the specific objectives/aims of the proposed project.

Project Timetable:

This section should outline as a function of time, year by year, all the important activities or phases of the project, including any activities planned beyond the project period. Successful applicants must use this project timetable to report progress.

Project Performance Site

Indicate the primary site where the work will be performed. If a portion of the work will be performed at any other sites, identify those sites, also.

Biographical Sketch Appendix

Provide a biographical sketch for the project director/principal investigator (PD/PI) and each senior/key person listed in Section A on the R&R Budget form. Provide the biographical sketch information as an appendix to your project narrative. Do not attach a separate file. The biographical sketch appendix will not count in the project narrative page limitation. The biographical information for each person must not exceed 3 pages when printed on 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right) with font not smaller than 11 point and must include:

Education and Training. Undergraduate, graduate and postdoctoral training, provide institution, major/area, degree and year.

Research and Professional Experience: Beginning with the current position list, in chronological order, professional/academic positions with a brief description.

Publications. Provide a list of up to 10 publications most closely related to the proposed project. For each publication, identify the names of all authors (in the same sequence in which they appear in the publication), the article title, book or journal title, volume number, page numbers, year of publication, and website address if available electronically.

Patents, copyrights and software systems developed may be provided in addition to or substituted for publications.

Synergistic Activities. List no more than 5 professional and scholarly activities related to the effort proposed.

Current and Pending Support Appendix.

Provide a list of all current and pending support (both Federal and non-Federal) for the Project Director/Principal Investigator(s) (PD/PI) and senior/key persons, including subawardees, for ongoing projects and pending applications. For each organization providing support, show the total award amount for the entire award period (including indirect costs) and the number of person-months per year to be devoted to the project by the senior/key person. Provide the Current and Pending Support as an appendix to your project narrative. Do not attach a separate file. The Current and Pending Support Appendix will not count in the project narrative page limitation. Concurrent submission of an application to other organizations for simultaneous consideration will not prejudice its review. Save the information in a separate file and attach to the “Attach Current and Pending Support” field in each profile.

Identification of Potential Conflicts of Interest/Bias in Selection of Reviewers Appendix.

Provide the following information in this appendix and append to your project narrative. Do not attach a separate file. (This appendix will not count in the project narrative page limitation):

Collaborators and Co-editors: List in alphabetical order all persons, including their current organizational affiliation, who are, or who have been, collaborators or co-authors with you on a research project, book or book article, report, abstract, or paper during the 48 months preceding the submission of this application. Also, list any individuals who are currently, or have been, co-editors with you on a special issue of a journal, compendium, or conference proceedings during the 24 months preceding the submission of this application. If there are no collaborators or co-editors to report, state “None.”

Graduate and Postdoctoral Advisors and Advisees: List the names and current organizational affiliations of your graduate advisor(s) and principal postdoctoral

sponsor(s) during the last 5 years. Also, list the names and current organizational affiliations of your graduate students and postdoctoral associates during the past 5 years.

Bibliography & References Cited Appendix

Provide a bibliography of any references cited in the Project Narrative. Each reference must include the names of all authors (in the same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers, and year of publication. Include only bibliographic citations. Applicants should be especially careful to follow scholarly practices in providing citations for source materials relied upon when preparing any section of the application. In order to reduce the number of files attached to your application, please provide the Bibliography and References Cited information as an appendix to your project narrative. This appendix will not count in the project narrative page limitation

Facilities & Other Resources Appendix

This information is used to assess the capability of the organizational resources, including subawardee resources, available to perform the effort proposed. Identify the facilities to be used (Laboratory, Animal, Computer, Office, Clinical and Other). If appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. Describe only those resources that are directly applicable to the proposed work. Describe other resources available to the project (e.g., machine shop, electronic shop) and the extent to which they would be available to the project. In order to reduce the number of files attached to your application, please provide the Facility and Other Resource information as an appendix to your project narrative. This appendix will not count in the project narrative page limitation.

Equipment Appendix

List major items of equipment already available for this project and, if appropriate identify location and pertinent capabilities. In order to reduce the number of files attached to your application, please provide the Equipment information as an appendix to your project narrative. This appendix will not count in the project narrative page limitation.

Other Attachment Appendix

If you need to elaborate on your responses to questions 1-5 on the “Other Project Information” document, please provide this information as an appendix to your project narrative. This appendix will not count in the project narrative page limitation.

Do not attach files for fields 8, 9, 10, and 11, instead follow the above instructions to include the information as appendices to the project narrative file.

3. RESEARCH AND RELATED BUDGET.

Complete the Research and Related Budget form in accordance with the instructions on the form (Activate Help Mode to see instructions) and the following instructions. You must complete a separate budget for each year of support requested. The form will generate a cumulative budget for the total project period. You must complete all the mandatory information on the form before the NEXT PERIOD button is activated. You may request funds under any of the categories listed as long as the item and amount are necessary to perform the proposed work, meet all the criteria for allowability under the applicable Federal cost principles, and are not prohibited by the funding restrictions in this announcement (See PART IV, G).

Budget Justification (Field K on the form).

Provide the required supporting information for the following costs (See R&R Budget instructions): equipment; domestic and foreign travel; participant/trainees; material and supplies; publication; consultant services; ADP/computer services; subaward/consortium/contractual; equipment or facility rental/user fees; alterations and renovations; and indirect cost type. Provide any other information you wish to submit to justify your budget request. Attach a single budget justification file for the entire project period in Field K. The file automatically carries over to each budget year.

- 4. SF-LLL Disclosure of Lobbying Activities** If applicable, complete SF- LLL. Applicability: If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the grant/cooperative agreement, you must complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying."

Summary of Required Forms/Files

Your application must include the following documents:

Name of Document	Format	Attach to
SF 424 (R&R)	PureEdge Form	N/A
RESEARCH AND RELATED Other Project Information	PureEdge Form	N/A
Project Summary/Abstract	PDF	Field 6
Project Narrative, including required appendices	PDF	Field 7
RESEARCH & RELATED BUDGET	PureEdge Form	N/A
Budget Justification	PDF	Field K

D. SUBMISSIONS FROM SUCCESSFUL APPLICANTS.

If selected for award, DOE reserves the right to request additional or clarifying information for any reason deemed necessary, including, but not limited to:

- Indirect cost information
- Other budget information
- Name and phone number of the Designated Responsible Employee for complying with national policies prohibiting discrimination (See 10 CFR 1040.5)
- Representation of Limited Rights Data and Restricted Software, if applicable
- Commitment Letter from Third Parties Contributing to Cost Sharing, if applicable

E. SUBMISSION DATES AND TIMES.

1. Preapplication Due Date.

Potential applicants are *required* to submit a two-page preapplication by email to fjohnsonr@ascr.doe.gov. Preapplications must be received by **April 6, 2007, 4:30 p.m., Eastern Time**. The subject line of the email should be: "**FASTOS Preapplication**". The preapplication should be a Word file attached to the email, having 1 inch margins when printed. No FAX or mail submission of preapplications will be accepted.

Preapplications will be reviewed for conformance with the guidelines and technical areas specified in this announcement. A response to preapplications encouraging or discouraging formal applications will be communicated to the applicants by April 13, 2007. Applicants who have not received a response regarding the status of their preapplication by this date are responsible for contacting the program to confirm their status.

Preapplications should consist of no more than two pages total. This narrative should give the project title and describe the research objectives, the technical approach(s), and all proposed team members and their expertise. It should also include a rough estimate of

the planned budget request. The intent in requesting a preapplication is to save the time and effort of applicants in preparing and submitting a formal project application that may be inappropriate for the program. Preapplications also assist ASCR in planning the peer review process and the selection of potential reviewers for the application. **Formal applications will be accepted only from preapplicants encouraged to submit a formal application.**

SC's preapplication policy can be found on SC's Grants and Contracts Web Site at: <http://www.science.doe.gov/grants/preapp.html>. Please contact Dr. Fred Johnson at (301) 903-5800, for any questions related to this announcement.

2. Application Due Date.

Applications must be received by June 11, 2007, 8:00 PM Eastern Time. You are encouraged to transmit your application well before the deadline. **APPLICATIONS RECEIVED AFTER THE DEADLINE WILL NOT BE REVIEWED OR CONSIDERED FOR AWARD.**

This program is not subject to Executive Order 12372 – Intergovernmental Review of Federal Programs.

G. FUNDING RESTRICTIONS.

Cost Principles. Costs must be allowable in accordance with the applicable Federal cost principles referenced in 10 CFR Part 600. The cost principles for commercial organization are in FAR Part 31.

Pre-award Costs. Recipients may charge to an award resulting from this announcement pre-award costs that were incurred within the ninety (90) calendar day period immediately preceding the effective date of the award, if the costs are allowable in accordance with the applicable Federal cost principles referenced in 10 CFR Part 600. Recipients must obtain the prior approval of the contracting officer for any pre-award costs that are for periods greater than this 90 day calendar period.

Pre-award costs are incurred at the applicant's risk. DOE is under no obligation to reimburse such costs if for any reason the applicant does not receive an award or if the award is made for a lesser amount than the applicant expected.

H. OTHER SUBMISSION AND REGISTRATION REQUIREMENTS

1. Where to Submit.

APPLICATIONS MUST BE SUBMITTED THROUGH GRANTS.GOV TO BE CONSIDERED FOR AWARD. Submit electronic applications through the “Apply for Grants” function at www.Grants.gov. If you have problems completing the registration process or submitting your application, call Grants.gov at 1-800-518-4726 or send an e-mail to support@grants.gov.

2. Registration Process.

You must COMPLETE the one-time registration process (all steps) before you can submit your first application through Grants.gov (See <http://www.grants.gov/GetStarted>). **We recommend that you start this process at least three weeks before the application due date.** It may take 21 days or more to complete the entire process. Use the Grants.gov Organizational Registration Checklists at <http://www.grants.gov/assets/OrganizationRegCheck.pdf> to guide you through the process. **IMPORTANT:** During the CCR registration process, you will be asked to designate an E-Business Point of Contact (EBIZ POC). The EBIZ POC must obtain a special password called “Marketing Partner Identification Number” (MPIN). When you have completed the process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e. Grants.gov registration).

3. Application Receipt Notices

After an application is submitted, the Authorized Organization Representative (AOR) will receive a series of five e-mails. It is extremely important that the AOR watch for and save each of the e-mails. It may take up to two (2) business days from application submission to receipt of e-mail Number 2. When the AOR receives e-mail Number 5, it is their responsibility to follow the instructions in the e-mail to logon to IIPS and verify that their application was received by DOE. You will need the Submission Receipt Number (e-mail Number 1) to track a submission. The titles of the five e-mails are:

- Number 1 - Grants.gov Submission Receipt Number
- Number 2 - Grants.gov Submission Validation Receipt for Application Number
- Number 3 - Grants.gov Grantor Agency Retrieval Receipt for Application Number
- Number 4 - Grants.gov Agency Tracking Number Assignment for Application Number
- Number 5 – DOE e-Center Grant Application Received

The last e-mail will contain instructions for the AOR to register with the DOE e-Center. If the AOR is already registered with the DOE e-Center, the title of the last e-mail changes to:

Number 5 – DOE e-Center Grant Application Received and Matched

This e-mail will contain the direct link to the application in IIPS. The AOR will need to enter their DOE e-Center user id and password to access the application.

Part V - APPLICATION REVIEW INFORMATION

A. CRITERIA

1. Initial Review Criteria.

Prior to a comprehensive merit evaluation, DOE will perform an initial review in accordance with 10 CFR 605.10(b).

2. Merit Review Criteria.

Applications will be subjected to scientific merit review (peer review) and will be evaluated against the following evaluation criteria which are listed in descending order of importance codified at 10 CFR 605.10(d):

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; and
4. Reasonableness and Appropriateness of the Proposed Budget.

The evaluation process will include program policy factors such as the relevance of the proposed research to the terms of the announcement and the agencies' programmatic needs. Note that external peer reviewers are selected with regard to both their scientific expertise and the absence of conflict-of-interest issues. Both Federal and non-Federal reviewers may be used, and submission of an application constitutes agreement that this is acceptable to the investigator(s) and the submitting institution.

B. REVIEW AND SELECTION PROCESS.

1. Merit Review.

Applications that pass the initial review will be subjected to a merit review in accordance with the guidance provided in the "Office of Science Merit Review System for Financial Assistance." This Merit Review System is available at <http://www.science.doe.gov/grants/merit.html>.

2. Selection.

The Selection Official will consider the merit review recommendation, program policy factors, and the amount of funds available.

3. Discussions and Award.

The Government may enter into discussions with a selected applicant for any reason deemed necessary, including, but not limited to: (1) the budget is not appropriate or reasonable for the requirement; (2) only a portion of the application is selected for award; (3) the Government needs additional information to determine that the recipient is capable of complying with the requirements in 10 CFR part 600; and/or (4) special terms and conditions are required. Failure to resolve satisfactorily the issues identified by the Government will preclude award to the applicant.

C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES.

DOE is striving to make awards within eight months. The time interval begins on the date applications are due or the date the application is received, if there is no specified due date/deadline.

Part VI - AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES.

1. Notice of Selection.

DOE will notify applicants selected for award. This notice of selection is not an authorization to begin performance. (See Part IV.G with respect to the allowability of pre-award costs.)

Organizations whose applications have not been selected will be advised as promptly as possible. This notice will explain why the application was not selected.

2. Notice of Award.

A Notice of Financial Assistance Award issued by the contracting officer is the authorizing award document. It normally includes, either as an attachment or by reference: 1. Special Terms and Conditions; 2. Applicable program regulations, if any; 3. Application as approved by DOE; 4. DOE assistance regulations at 10 CFR Part 600, or, for Federal Demonstration Partnership (FDP) institutions, the FDP terms and conditions; 5. National Policy Assurances To Be Incorporated As Award Terms; 6. Budget Summary; and 7. Federal Assistance Reporting Checklist, which identifies the reporting requirements.

B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS.

1. Administrative Requirements.

The administrative requirements for DOE grants and cooperative agreements are contained in 10 CFR part 600 and 10 CFR Part 605 (See: <http://ecfr.gpoaccess.gov>), except for grants made to Federal Demonstration Partnership (FDP) institutions. The FDP terms and conditions and DOE FDP agency specific terms and conditions are located on the National Science Foundation web site at http://www.nsf.gov/awards/managing/fed_dem_part.jsp.

2. Special Terms and Conditions and National Policy Requirements.

Special Terms and Conditions and National Policy Requirements.

The DOE Special Terms and Conditions for Use in Most Grants and Cooperative Agreements are located at <http://grants.pr.doe.gov>. The National Policy Assurances To Be Incorporated As Award Terms are located at <http://grants.pr.doe.gov>.

Intellectual Property Provisions.

The standard DOE financial assistance intellectual property provisions applicable to the various types of recipients are located at http://www.gc.doe.gov/techtrans/sipp_matrix.html.

C. REPORTING.

Reporting requirements are identified on the Federal Assistance Reporting Checklist, DOE F 4600.2, attached to the award agreement.

PART VII - QUESTIONS/AGENCY CONTACTS

A. QUESTIONS

Questions regarding the content of the announcement must be submitted through the “Submit Question” feature of the DOE Industry Interactive Procurement System (IIPS) at <http://e-center.doe.gov>. Locate the program announcement on IIPS and then click on the “Submit Question” button. Enter required information. You will receive an electronic notification that your question has been answered. DOE will try to respond to a question within 3 business days, unless a similar question and answer have already been posted on the website.

Questions relating to the registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov. DOE cannot answer these questions.

B. Agency Contact

Dr. Frederick Johnson
Telephone: (301) 903-5800
Fax: (301) 903-7774
E-mail: fjohnson@er.doe.gov.

PART VIII - OTHER INFORMATION

A. MODIFICATIONS.

Notices of any modifications to this announcement will be posted on Grants.gov and the DOE Industry Interactive Procurement System (IIPS). You can receive an email when a modification or an announcement message is posted by joining the mailing list for this announcement through the link in IIPS. When you download the application at Grants.gov, you can also register to receive notifications of changes through Grants.gov.

B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE.

DOE reserves the right, without qualification, to reject any or all applications received in response to this announcement and to select any application, in whole or in part, as a basis for negotiation and/or award.

C. COMMITMENT OF PUBLIC FUNDS.

The Contracting Officer is the only individual who can make awards or commit the Government to the expenditure of public funds. A commitment by other than the Contracting Officer, either explicit or implied, is invalid.

D. PROPRIETARY APPLICATION INFORMATION.

Patentable ideas, trade secrets, proprietary or confidential commercial or financial information, disclosure of which may harm the applicant, should be included in an application only when such information is necessary to convey an understanding of the proposed project. The use and disclosure of such data may be restricted, provided the applicant includes the following legend on the first page of the project narrative and specifies the pages of the application which are to be restricted:

“The data contained in pages _____ of this application have been submitted in confidence and contain trade secrets or proprietary information, and such data shall be used or disclosed only for evaluation purposes, provided that if this applicant receives an award as a result of or in connection with the submission of this application, DOE shall have the right to use or disclose the data herein to the extent provided in the award. This restriction does not limit the government’s right to use or disclose data obtained without restriction from any source, including the applicant.”

To protect such data, each line or paragraph on the pages containing such data must be specifically identified and marked with a legend similar to the following:

“The following contains proprietary information that (name of applicant) requests not be released to persons outside the Government, except for purposes of review and evaluation.”

E. EVALUATION AND ADMINISTRATION BY NON-FEDERAL PERSONNEL.

In conducting the merit review evaluation, the Government may seek the advice of qualified non-Federal personnel as reviewers. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The applicant, by submitting its

application, consents to the use of non-Federal reviewers/administrators. Non-Federal reviewers must sign conflict of interest and non-disclosure agreements prior to reviewing an application. Non-Federal personnel conducting administrative activities must sign a non-disclosure agreement.

F. INTELLECTUAL PROPERTY DEVELOPED UNDER THIS PROGRAM.

Patent Rights. The government will have certain statutory rights in an invention that is conceived or first actually reduced to practice under a DOE award. 42 U.S.C. 5908 provides that title to such inventions vests in the United States, except where 35 U.S.C. 202 provides otherwise for nonprofit organizations or small business firms. However, the Secretary of Energy may waive all or any part of the rights of the United States subject to certain conditions. (See “Notice of Right to Request Patent Waiver” in paragraph G below.)

Rights in Technical Data. Normally, the government has unlimited rights in technical data created under a DOE agreement. Delivery or third party licensing of proprietary software or data developed solely at private expense will not normally be required except as specifically negotiated in a particular agreement to satisfy DOE’s own needs or to insure the commercialization of technology developed under a DOE agreement.

G. NOTICE OF RIGHT TO REQUEST PATENT WAIVER.

N/A

H. NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES.

N/A