

**FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT**



U.S. Department of Energy

Office of Science

Office of Advanced Scientific Computing Research (ASCR)

Scientific Collaborations at Extreme-Scale

Funding Opportunity Number: DE-FOA-0000695

Announcement Type: Initial

CFDA Number: 81.049

ISSUE DATE: March 20, 2012

Application Due Date: April 27, 2012, 11:59 p.m. 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 Central Contract Registry (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 (i.e., obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number, register with the CCR, register with the credential provider, and register with Grants.gov). To register with Grants.gov go to “Get Registered” at http://grants.gov/applicants/get_registered.jsp. 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 Funding Opportunity Announcement (FOA) 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 four e-mails. It is extremely important that the AOR watch for and save each of the emails. It may take up to two (2) business days from application submission to receipt of email Number 2. The titles of the four 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

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**
- I. Availability of Funds**

PART I – FUNDING OPPORTUNITY DESCRIPTION

GENERAL INQUIRIES ABOUT THIS FOA SHOULD BE DIRECTED TO:

Technical/Scientific Program Contacts:

Program Manager: Richard Carlson
Office of Advanced Scientific Computing Research, SC-21.1
Email: richard.carlson@science.doe.gov

Program Manager: Dr. Thomas Ndousse-Fetter
Office of Advanced Scientific Computing Research, SC-21.1
Email: Thomas.ndousse-fetter@science.doe.gov

STATUTORY AUTHORITY

Public Law 95-91, US Department of Energy Organization Act
Public Law 109-58, Energy Policy Act of 2005

APPLICABLE REGULATIONS

U.S. Department of Energy Financial Assistance Rules, codified at 10 CFR Part 600
U.S. Department of Energy, Office of Science Financial Assistance Program Rule, codified at 10 CFR Part 605

SUMMARY:

The Office of Advanced Scientific Computing Research (ASCR) of the Office of Science (SC), U.S. Department of Energy (DOE), hereby invites applications for research and development that represents transformational advances in scientific collaboration systems and distributed data systems addressing the fundamental challenges related to extreme-scale science collaborations.

Scientific grand challenges in the next decade in areas such as combustion modeling, climate science, energy generation, bio-remediation processes, and material structure aging will usher in the era of extreme-scale science. Increasingly these challenges may only be solved by multi-disciplinary teams working with unique scientific instruments, exascale class computers, and/or handling extreme amounts of data. To meet these challenges these teams will need a distributed science environment that promotes scientific collaboration and resource sharing.

Scientists currently rely on basic, and fairly primitive, tools and services designed for social networking and commercial activities to carry out simple collaboration tasks. However, these primitive collaboration tools are proving to be inadequate for large-scale scientific efforts involving the sharing of massive data sets or complex instruments, among thousands of

distributed researchers. The focus of this announcement is on transformative approaches to understanding and/or enabling scientific collaborations at a scale not possible with today's knowledge or using current Internet-based services and tools.

More specific information is included under SUPPLEMENTARY INFORMATION below.

A companion Program Announcement to DOE National Laboratories, LAB 12-695, will be posted on the SC Grants and Contracts web site at: <http://www.science.doe.gov/grants>

SUPPLEMENTARY INFORMATION:

Extraordinary advances in computing and communication technologies are transforming the scientific process from a labor intensive manual process to one where discovery can take place over large distances or with multiple collaborators. The scale and complexity of some of today's major scientific undertakings require that scientists work in large globally distributed multi-disciplinary teams. Other experiments require that individuals or small groups of scientists work remotely to achieve their scientific goals. In either case, these scientists must manage large data sets; access national and international instruments in real-time from hundreds to thousands of miles away, run simulations on leadership class supercomputers, and effectively communicate with peers located at remote institutions.

Currently the understanding of how to build, operate, maintain, and expand scientific collaboration systems relies on a basic understanding of how scientists work together and a primitive set of tools and services to support this work. Future collaboration systems will be expected to support scientific exploration at the extreme-scale: handling the generation, archiving, and distribution of massive data sets; providing support for real-time and near-time co-development activities; and allowing scientists to access remote instruments and computing resources as if they were local. These collaboration systems must also be simple to use and integrate multiple tools and services into an intuitive whole that enhances the scientific discovery process.

Given that scientific data will come from different sources (extreme-scale computing and unique scientific instruments), take different forms (structured and unstructured), and in some cases require streaming or near-time processing, it is unlikely that conventional data management approaches will adequately address these emerging scientific data management challenges. Key attributes of extreme data sets include: data volume, complexity, heterogeneity, ownership, provenance, and sharing mechanisms.

Real-time and near-time activities span a wide range of activities from interactive manipulation of a simulation output to time limited data analysis activities (e.g., analyzing the output of a tokamak experiment to set the parameters for the next shot). These activities require interacting with both the generated data and the scientists and engineers looking at this data. Enabling attributes of time sensitive activities include: latency impacts, jitter and loss impacts, and synchronization between multiple independent data streams.

Scientific collaborations come in a variety of sizes ranging from an individual scientist accessing a remote instrument to a globally distributed experiment with thousands of scientists and engineers interacting on a long term project. These collaborations involve many actions from finding resources (data, instruments, and people) to using these resources in an effective manner. Enabling attributes of scientific collaborations include: resource discovery, access, usage, and scheduling.

Research activities in these topics should focus on developing knowledge, algorithms, libraries, tools, services, and frameworks for a new scientific exploration environment that supports collaborative scientific discovery effectively at extreme-scales. This work will have revolutionary impacts on critical science facilities (instruments, computing systems, data archives) which are accessed and shared by distributed scientific communities across the DOE-SC complex. The topics of interest for this FOA include but are not limited to:

- Resource discovery and management – the ability to find and use the appropriate resources (people, data, instruments, computers, and/or documents) that are scattered around the globe. Large scale collaborations rely on the user’s ability to find and use resources scattered throughout the collaborative environment. This subsection requests applications that simplify the use of distributed resources or develop fundamental principles of how such systems will operate. Examples include: workflow frameworks, distributed registration/query systems (standards based tools/services that allow objects to advertise their capabilities and users to find these objects), dynamic and flexible resource provisioning mechanisms (resource brokers and meta-schedulers), VM image creation and management tools (reduce/eliminate the need for a scientist to be a local sys-admin), and grid/cloud provisioning and management services (cluster management systems).
- Identity Management – the ability to securely access local and remote resources, or have resources securely act on a users behalf, while continuing to support local control over physical resources. The ability for a collaboration to control its physical resources while accessing resources owned by resource providers is key to the collaborations’ success. This subsection requests applications that enable this resource sharing by developing tools, services, protocols, and open standards. Examples include: site management tools (tools a lab/facility manager would use to define/enforce local policies), standards based back-end services (the schemas and mechanisms needed to operate an Identity Management service i.e., certificate servers, attribute servers, policy servers, etc) and interactive and batch based services (interactive services rely on a human responding to prompts i.e., web based service, a batch service is launched by a human or automated process and runs to completion autonomously).
- Integration Enhancements – the ability to simplify the establishment and operation of collaborations. Scientific collaborations use a variety of tools and services to enable the interaction between people, instruments, and data. All too often these are stand-alone tools with their own unique discovery and identity management interfaces. Future collaborations will require tools that are simpler to use and integrated multi-vendor tools and services that provides a satisfying user experience with appropriate security mechanisms and interfaces. This subsection requests applications that deal with this access and integration need.

Examples include: integrated discovery and audio conferencing (establish an ad-hoc conference with the person at control room console 4, the shift supervisor, and the remote PI), workspace integration (merging smartphones and other personal devices into a scientist's workspace), and archival services (save the actions taken to establish/run a collaboration task so it can be done again in the future).

- Streaming data management – Scientific collaborations may have time sensitive elements or tasks that must be accomplished in a fixed amount of time. This subsection requests applications for innovative approaches to support interactive data-intensive collaborations involving data streaming and near-time data processing that may be needed to support time-sensitive collaboration activities such as computational steering, remote instrument operations, and remote visualization.

The DOE science community is a highly diverse domain-specific science environment, each with unique modality of scientific research collaboration requirements. Developing collaborative software sub-systems that can adapt to meet the needs of these diverse communities is a daunting challenge. Applicants are therefore encouraged to propose and use software development methodologies and open architecture frameworks that encourage re-usability, extensibility, and scalability to facilitate the adoption of their tools into different domain-specific environments.

The Scientific Collaborations for Extreme-Scale Science (SCESS) workshop report provides more details on the research needs for future scientific collaborations. Applications that propose partnerships with other DOE program offices are strongly encouraged. Applicants should contact the ASCR program manager to discuss potential partnership applications to ensure that the application will benefit both ASCR and the other DOE program office. The Office of Biological and Environmental Research (BER), the Office of Fusion Energy Sciences (FES), and the Office of High Energy Physics (HEP) program offices have expressed interest in partnerships.

Applications proposing computer science advancements that have strong synergies with science funded by BER to further the BER mission, such as addressing the distributed computing and data needs of the Earth System Grid (ESG) for the climate modeling community will be considered. The successful application will leverage recent advances in high-speed networks and related high-performance middleware technologies to upgrade and enhance the capability of the ESG.

Applications addressing scientific collaboration issues of importance to FES, including those associated with remote collaborations, remote instrumentation, and data streaming will be considered.

Applications proposing computer science advancements that have strong synergies with science funded by HEP to further the HEP mission, such as distributed computing and data needs for U.S. Large Hadron Collider (LHC) computing and/or Cosmic Frontier Research will be considered.

An official submission with well-delineated tasks, deliverables, and budget pages is required from each participating institution. Respondents interested in pilot/demonstration projects directly tied to an Office of Science Program Office, other than ASCR, should coordinate with the appropriate program office.

DOE Facilities Awareness

Potential awards focusing on technologies that target collaboration environment for scientific instruments should visit the Office of Science user's facility website to ensure that instruments selected are within the scope of DOE's Office of Science mission. Abbreviated lists of user's facilities listed by sponsoring program office include but are not limited to:

Office of Advance Scientific Computing research (ASCR-Facilities)

<http://science.energy.gov/ascr/facilities/>

- Oak ridge Leadership Computing Facility <http://www.olcf.ornl.gov/>
- Argonne Leadership Computing Facilities <http://www.alcf.anl.gov/>
- National Energy Research Scientific Computing Center (NERSC)
<http://science.energy.gov/ascr/facilities/nersc/>
- Energy Sciences Network (ESnet) <http://science.energy.gov/ascr/facilities/esnet/>

Office of Basic Energy Sciences (BES) <http://science.energy.gov/bes/>

- National Synchrotron Light Source (NSLS-II) <http://www.bnl.gov/ps/nsls2/about-NSLS-II.asp>
- Linac Coherent Light Source (LCLS) <http://lcls.slac.stanford.edu/aboutlcls.aspx>
- Advanced Photon Source (APS) <http://aps.anl.gov/>
- Spallation Neutron Source (SNS) <http://neutrons.ornl.gov/facilities/SNS/>

Office of Biological and Environmental Research (BER) <http://science.energy.gov/ber/>

- Atmospheric Radiation Measurement Climate Research Facility
<http://science.energy.gov/ber/research/cesd/arm-climate-research-facility/>
- William R. Wiley Environmental Molecular Sciences Laboratory (EMSL)
<http://www.emsl.pnl.gov/emslweb/>
- Joint Genome Institute (JGI) <http://www.jgi.doe.gov/>

Office High Energy Physics (HEP) <http://science.energy.gov/hep/>

- Large Hadron Collider (LHC/CMS) <http://www.uslhc.us/>

Office Nuclear Energy (NP) <http://science.energy.gov/np/>

- Large Hadron Collider (LHC/ATLAS) <http://www.uslhc.us/>

Virtual Facilities

- Earth systems Grid – Biological and Environmental Sciences Research
<http://www.earthsystemgrid.org/home.htm>
- Open Science Grid – High Energy Physics and Nuclear Energy Physics
<http://www.opensciencegrid.org/>

ASCR Research Initiatives Awareness

ASCR has ongoing large research initiatives that embody many aspects of scientific collaboration requirements described in this FOA. An awareness of scientific collaboration and distributed data-intensive science opportunities and challenges can be beneficial to potential proposers. The major activities include:

- ASCR Co-Design Centers - The co-design is a new paradigm to accelerate the conception and development of productive exascale computer systems through a multi-disciplinary collaborative arrangement that vertically integrates the requirements, expertise, and resources of all stake-holders (scientific applications teams, applied mathematicians, system software developers, supercomputer centers, computer vendors, and technology developers). More information on the current ASCR exascale co-design centers are available at: <http://science.energy.gov/ascr/research/scidac/co-design/>
- SciDAC- III Institutes and Partnerships – imitated in 2001, SciDAC (Scientific Discovery through Advanced Computing) is highly successful program supporting scientific inquiry that bring together computational scientists (applied mathematicians computers scientists) with domain scientists to apply high performance computing to solve complex problems. Additional information on the current research activities along with anticipated collection of scientific partnerships can be found at: <http://www.scidac.gov/institutes.html>

References

- [1] DOE ASCR 2011 Scientific Collaborations for Extreme-Scale Science (SCESS) Workshop, December 6-7, 2011, Gaithersburg Marriott Washington Center, Gaithersburg, MD - SCESS Workshop Report
- [2] Terabits Networks for Extreme-Scale Science, February 16-17, 20011, Rockville Hotel & Executive Meeting Center, MD – PDF Report
- [3] Data and Communications in Basic Energy Sciences: Creating a Pathway for Scientific Discovery Workshop, October 24-25, 2011, Bethesda Marriott Hotel and Conference Center, Bethesda, MD – PDF Report
- [4] DOE Exascale Workshop on Data Analysis, Management, and Visualization Workshop, February 22-23, 2011, Hilton Hotel, Houston, TX – PDF Report
- [5] Cross-cutting Technologies for computing at the Exascale Workshop, February 2-4, 2010, Washington DC – PDF Report

[6] Modeling and Simulation at the Exascale for Energy and the Environment Town Hall Meetings Series June – May 2007 - PDF Report

[7] ASCR SciDAC-III Institutes

[8] ASCR SciDAC-III Scientific Application Partnerships (SAPs) and related FOAs: (1) BES – materials and chemical sciences, 2) HEP – high energy physics, 3) FES - Fusion energy science, and 4) BER – earth system science

[9] The Fourth Paradigm: Data-intensive Scientific Discovery, Microsoft Research publication

[10] Peter Spyn et al., “Data modeling versus Ontology engineering,” in <http://lsdis.cs.uga.edu/SemNSF/SIGMOD-Record-Dec02/Meersman.pdf>

[11] Lori A. Freitag and Raymond M. Loy, “Theoretical Cost Comparison of Remote Visualization Strategies,” <http://www.mcs.anl.gov/uploads/cels/papers/P1037.pdf>

[11] Asbjørn Rygg et al, A Unified Model of Batch and Interactive Scientific Workflow and its Implementation using Windows Workflow, <http://eprints.qut.edu.au/9313/1/9313.pdf>

[12] Lavanya Ramakrishnan et al, A Multi-Dimensional Classification Model for ScientificWorkflow Characteristics, <http://www.cs.indiana.edu/~plale/papers/RamakrishnanWANDS2010.pdf>

Collaborations

Collaborative research projects with other institutions, such as universities, industry, non-profit organizations, and Federally Funded Research and Development Centers (FFRDCs), including the DOE National Laboratories, are strongly encouraged. Collaborative applications submitted from different institutions should clearly indicate they are part of a proposed collaboration and contain the same title, Abstract and Narrative for that research project. In addition, such applications must describe the work and the associated budget for the research effort being performed under the leadership of the Principal Investigator at that participating institution.

These collaborative applications should all have the same title as the Lead Institution. Each collaborating institution submitting an application must use the same title in Block 11 of the SF 424 (R&R) form. Additional information on developing and submitting collaborative submissions can be found at <http://www.sc.doe.gov/grants/colab.asp>.

PART II – AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT.

DOE anticipates awarding Grants under this FOA.

B. ESTIMATED FUNDING.

It is anticipated that up to of \$4.7 million annually for three years will be available for multiple awards in three categories: 1) single individual/single institution award, 2) medium size collaborations, and 3) large demonstrations or pilot awards.

- **Single Investigator Award** – these are traditional awards made to a single investigator in an institution. The funding level for this type of award is up to \$150K/year for three years.
- **Medium collaboration Awards** – are multiple investigators projects involving several (two – four) investigators. The funding level for this type of award is up to \$450K/year for three years.
- **Pilot/Large Demonstration Awards** – are large awards involving multiple investigators from two or more institutions. These projects may involve work with other DOE-SC program offices, projects that prototype interconnecting a SC instrument to an ASCR compute facility, or projects addressing ASCR basic research needs. The funding level for this type of award is up to \$1,000K/year for three years.

All awards are contingent on the availability of funds and programmatic needs. DOE is under no obligation to pay for any costs associated with the preparation or submission of an application. DOE reserves the right to fund, in whole or part, any, all, or none of the applications submitted in response to this FOA.

C. MAXIMUM AND MINIMUM AWARD SIZE.

The award size will depend on the number of meritorious applications and the availability of appropriated funds. It is expected that the maximum award size for universities would be up to \$1,000,000 and the minimum would be \$50,000.

D. EXPECTED NUMBER OF AWARDS.

The exact number of awards will depend on the number of meritorious applications and the availability of appropriated funds. We expect to award 6 small, 2 medium, and 1 large.

E. ANTICIPATED AWARD SIZE.

The award size will depend on the number of meritorious applications and the availability of appropriated funds. It is expected that the maximum award size for universities would be up to \$1,000,000 and the minimum would be \$50,000.

F. PERIOD OF PERFORMANCE.

Grants are expected to be made for a period of three years at a funding level appropriate for the proposed scope, with out-year support contingent on the availability of appropriated funds and satisfactory progress.

G. TYPE OF APPLICATION.

DOE will accept new applications under this FOA.

PART III - ELIGIBILITY INFORMATION

A. ELIGIBLE APPLICANTS.

All types of domestic 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 a Grant Application Package**". Enter the CFDA and/or the funding opportunity number located on the cover of this FOA and then follow the prompts to download the application package.

B. LETTER OF INTENT AND PRE-APPLICATION

1. Letter of Intent (LOI).

N/A

2. Pre-Application.

N/A

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 FOA.**

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. The list of certifications and assurances referenced in Field 17 can be found on the DOE Financial Assistance Forms Page at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms> under Certifications and Assurances.

By submitting an application in response to this FOA the Applicant certifies that:

- It is **not** a corporation that has been convicted (or had an officer or agent of such corporation acting on behalf of the corporation convicted) of a felony criminal violation under any Federal law within the preceding 24 months,
- It is **not** a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability,

- If the Applicant’s financial assistance application is chosen for award and the award is in excess of \$1,000,000, the applicant will, by the end of the fiscal year, upgrade the efficiency of their facilities by replacing any lighting that does not meet or exceed the energy efficiency standard for incandescent light bulbs set forth in Section 325 of the Energy Policy and Conservation Act (42 U.S.C. 6295).

2. RESEARCH AND RELATED Other Project Information.

Complete questions 1 through 6 and attach files. The files must comply with the following instructions:

Project Summary/Abstract (Field 7 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) (PD/PI), the project title, the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (i.e., benefits, outcomes), and major participants (for collaborative projects). 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 8 on the Form).

The project narrative **must not exceed 25 pages** of technical information, 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.

Please do not submit general letters of support as these are not used in making funding decisions and can interfere with the selection of peer reviewers.

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 application narrative should begin with a cover page that includes: the project title, the Lead PI’s name and complete contact information.

The cover page must also include the following information (this page will not count in the project narrative page limitation):

- Applicant/Institution:**
- Street Address/City/State/Zip:**
- Principal Investigator:**

Postal Address:

Telephone Number:

Email:

Funding Opportunity Announcement Number: DE-FOA-0000695

DOE/Office of Science Program Office: Office of Advanced Scientific Computing Research (ASCR)

DOE/Office of Science Program Office Technical Contact: Richard Carlson and Dr. Thomas Ndousse-Fetter

Is this a Collaboration? If yes, please list ALL Collaborating Institutions/Pis* and indicate which ones will also be submitting applications. Also indicate the PI who will be the point of contact and coordinator for the combined research activity.

* 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.

The Project Narrative comprises the research plan for the project; it should contain enough background material in the Introduction, including review of the relevant literature, to demonstrate sufficient knowledge of the state of the science. The major part of the narrative should be devoted to a description and justification of the proposed project, including details of the method to be used. It should also include a timeline for the major activities of the proposed project, and should indicate which project personnel will be responsible for which activities.

Appendix 1: Biographical Sketch.

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 (curriculum vitae) for each person must not exceed 2 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.

Identification of Potential Conflicts of Interest or Bias in Selection of Reviewers. Provide the following information in this section:

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. For publications or collaborations with more than 10 authors or participants, only list those individuals in the core group with whom the Principal Investigator interacted on a regular basis while the research was being done. 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.

Appendix 2: Current and Pending Support.

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.

Appendix 3: Bibliography and References Cited.

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. **Provide the Bibliography and References Cited information as an Appendix to your project narrative. Do not attach a separate file.**

The Bibliography and References Cited Appendix will not count in the project narrative page limitation.

Appendix 4: Facilities and Other Resources.

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. **Provide the Facility and Other Resource information as an Appendix to your project narrative. Do not attach a separate file. The Facility and Other Resource Appendix will not count in the project narrative page limitation.**

Appendix 5: Equipment.

List major items of equipment already available for this project and, if appropriate identify location and pertinent capabilities. **Provide the Equipment information as an Appendix to your project narrative. Do not attach a separate file. The Equipment Appendix will not count in the project narrative page limitation.**

Appendix 6: Other Attachment.

If you need to elaborate on your responses to questions 1-6 on the “Other Project Information” document, **please provide the Other Attachment information as an Appendix to your project narrative. Do not attach a separate file. The Other Attachment Appendix will not count in the project narrative page limitation.**

Do not attach any of the requested Appendices described above as files for fields 9, 10, 11, and 12. Instead follow the above instructions to include the information as Appendices to the project narrative file (these Appendices will not count in the project narrative page limitation).

3. RESEARCH AND RELATED BUDGET.

Complete the Research and Related Budget form in accordance with the instructions on the form 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 FOA (See PART IV, G).

Budget Justification (Field K on the form).

Provide the required supporting information for the following costs: 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. R&R SUBAWARD BUDGET ATTACHMENT(S) FORM.

Budgets for Subawardees, other than DOE FFRDC Contractors. You must provide a separate cumulative R&R budget for each subawardee that is expected to perform work estimated to be more than \$100,000 or 50 percent of the total work effort (whichever is less). If you are selected for award, you must submit a multi-year budget for each of these subawardees. Download the R&R Budget Attachment from the R&R SUBAWARD BUDGET ATTACHMENT(S) FORM and e-mail it to each subawardee that is required to submit a separate budget. After the Subawardee has e-mailed its completed budget back to you, attach it to one of the blocks provided on the form. Use up to 10 letters of the subawardee's name (plus .xfd) as the file name (e.g., ucla.xfd or energyres.xfd).

5. PROJECT/PERFORMANCE SITE LOCATION(s)

Indicate the primary site where the work will be performed. If a portion of the project will be performed at any other site(s), identify the site location(s) in the blocks provided.

Note that the Project/Performance Site Congressional District is entered in the format of the 2 digit state code followed by a dash and a 3 digit Congressional district code, for example VA-001. Hover over this field for additional instructions.

Use the Next Site button to expand the form to add additional Project/Performance Site Locations.

6. 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, 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)	Form	N/A
RESEARCH AND RELATED Other Project Information	Form	N/A
Project Summary/Abstract	PDF	Field 7
Project Narrative, including required appendices	PDF	Field 8
RESEARCH & RELATED BUDGET	Form	N/A
Budget Justification	PDF	Field K
PROJECT/PERFORMANCE SITE LOCATION(S)	Form	N/A
SF-LLL Disclosure of Lobbying Activities, if applicable	Form	N/A

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. Letter of Intent.

N/A

2. Pre-Application.

N/A

3. Formal Applications.

APPLICATION DUE DATE: April 27, 2012, 11:59 PM Eastern Time

Formal applications submitted in response to this FOA must be received by **April 27, 2012, 11:59 PM Eastern Time**, for consideration of awards in Fiscal Year 2012. **You are encouraged to submit your application well before the deadline. APPLICATIONS RECEIVED AFTER THE DEADLINE WILL NOT BE REVIEWED OR CONSIDERED FOR AWARD.**

F. INTERGOVERNMENTAL REVIEW.

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 FOA 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 email 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 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. To register with Grants.gov go to "Get Registered" at http://grants.gov/applicants/get_registered.jsp. Use the Grants.gov Organization Registration Checklist 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).

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.

3. Application Receipt Notices

After an application is submitted, the Authorized Organization Representative (AOR) will receive a series of four e-mails. It is extremely important that the AOR watch for and save each of the emails. It may take up to two (2) business days from application submission to receipt of email Number 2. The titles of the four 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

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) to determine that (1) the applicant is eligible for the award; (2) the information required by the FOA has been submitted; (3) all mandatory requirements are satisfied; and (4) the proposed project is responsive to the objectives of the FOA. Applications that fail to pass the initial review will not be forwarded for merit review and will be eliminated from further consideration.

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). Included within each criterion are specific questions that the merit reviewers will be asked to consider.

1) Scientific and/or technical merit of the project

- Does the proposed research significantly advance the state-of-the-art in algorithms, libraries, tools, services, or frameworks needed to develop or support large scale science collaborations?
- Does the proposed research clearly address scalability, performance, resiliency, or energy efficiency issues?
- Does the proposed research significantly lower the barriers to effective collaborations involving a range of computing resources, large scale science instruments, or geographically dispersed science communities?
- What is the likelihood that the applicant can overcome the key challenges or shift research directions in response to promising advances in basic research?

2) Appropriateness of the proposed method or approach

- Does the research plan contain the development of prototypes of the proposed solution?
- Does the research plan include a demonstration of the viability of the proposed solution for adoption by existing collaborations?
- Does the research plan include validation strategies?
- Does the research plan contain appropriate performance metrics that will allow progress and contributions to be measured?
- If this is a collaborative application, does the management plan address the organization, communications, and coordination [activities](#) of the collaborating teams?

3) Competency of the applicant's personnel and adequacy of the proposed resources

- Do the applicants have a proven record of success in delivering results for collaborative science research?
- Do the applicants have a proven record of research and development in the disciplines needed for success?
- Are the roles and intellectual contributions of the Principal Investigator(s), and each senior/key personnel adequately described? Do you consider the contributions of each senior/key personnel of significant value for the project?

4) Reasonableness and appropriateness of the proposed budget

- Is the applicant's requested budget appropriate? Is the budget as lean as it can be to deliver the promised results? Are the budget overheads minimized?
- Does the requested budget support the applicant's specified management structure in a meaningful way?
- Does the applicant have a process for reallocating individuals funds to address changing priorities?
- Is travel budget appropriate? Are video conferencing technologies proposed to reduce the travel budget?

The selection official will consider the following program policy and management factors in the selection process:

- Potential impact of proposed research activities on the ASCR collaboratories program.
- Potential for developing synergies and/or relation of the proposed research activities to other research efforts supported by ASCR, particularly co-design;
- Total amount of DOE funds available; and
- A management plan that addresses the organization, communications, and coordination of the collaborating researchers. This plan should include mitigation strategies for foreseeable risks and explain how the project will have sufficient flexibility to adapt to changing priorities, challenges, and resources.

The evaluation process will include program policy factors such as the relevance of the proposed research to the terms of the FOA and the agency's 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.

C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES.

It is anticipated that selections will be completed by June 22, 2012. Awards will be made in Fiscal Year 2012.

PART VI - AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES.

1. Notice of Selection.

Selected Applicants Notification: 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.)

Non-selected Notification: 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.

An Assistance Agreement 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; 5. National Policy Assurances to be Incorporated as Award Terms; 6. Budget Summary; and 7. Federal Assistance Reporting Checklist, which identifies the reporting requirements.

For grants and cooperative agreements made to universities, non-profits and other entities subject to Title 2 CFR the Award also includes the Research Terms and Conditions located at: <http://www.nsf.gov/bfa/dias/policy rtc/index.jsp>.

B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS.

1. Administrative Requirements.

The administrative requirements for DOE grants and cooperative agreements are contained in 10 CFR 600 and 10 CFR Part 605 (See: <http://ecfr.gpoaccess.gov>). Grants and cooperative agreements made to universities, non-profits and other entities subject to Title 2 CFR are subject to the Research Terms and Conditions located on the National Science Foundation web site at: <http://www.nsf.gov/bfa/dias/policy rtc/index.jsp>.

DUNS and CCR Requirements

Additional administrative requirements for DOE grants and cooperative agreements are contained in 2 CFR, Part 25 (See: <http://ecfr.gpoaccess.gov>). Prime awardees must keep their data at CCR current. Subawardees at all tiers must obtain DUNS numbers and provide the DUNS to the prime awardee before the subaward can be issued.

Subaward and Executive Reporting

Additional administrative requirements necessary for DOE grants and cooperative agreements to comply with the Federal Funding and Transparency Act of 2006 (FFATA) are contained in 2 CFR, Part 170. (See: <http://ecfr.gpoaccess.gov>). Prime awardees must

register with the new FSRS database and report the required data on their first tier subawardees. Prime awardees must report the executive compensation for their own executives as part of their registration profile in the CCR.

2. 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://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms> under Award Terms. The National Policy Assurances to be Incorporated as Award Terms are located at: <http://www.nsf.gov/bfa/dias/policy/rtc/appc.pdf>.

Intellectual Property Provisions.

The standard DOE financial assistance intellectual property provisions applicable to the various types of recipients are located at: <http://energy.gov/gc/standard-intellectual-property-ip-provisions-financial-assistance-awards>.

Statement of Substantial Involvement

Either a grant or cooperative agreement may be awarded under this FOA. If the award is a cooperative agreement, the DOE Contract Specialist and DOE Project Officer will negotiate a Statement of Substantial Involvement prior to award.

C. REPORTING.

Reporting requirements are identified on the Federal Assistance Reporting Checklist, DOE F4600.2, attached to the award agreement. For a sample Checklist, see <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms>.

PART VII - QUESTIONS/AGENCY CONTACTS

A. QUESTIONS

Questions regarding the content of the FOA must be submitted through the FedConnect portal. You must register with FedConnect to respond as an interested party to submit questions, and to view responses to questions. It is recommended that you register as soon after release of the FOA as possible to have the benefit of all responses. More information is available at:

https://www.fedconnect.net/FedConnect/PublicPages/FedConnect_Ready_Set_Go.pdf.

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.

Applications submitted through FedConnect will not be accepted.

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 CONTACTS:

Technical/Scientific Program Contacts:

Program Manager: Richard Carlson

Office of Advanced Scientific Computing Research, SC-21.1

Email: richard.carlson@science.doe.gov

Program Manager: Dr. Thomas Ndousse-Fetter

Office of Advanced Scientific Computing Research, SC-21.1

Email: Thomas.ndousse-fetter@science.doe.gov

PART VIII - OTHER INFORMATION

A. MODIFICATIONS.

Notices of any modifications to this FOA will be posted on Grants.gov and the FedConnect portal. You can receive an email when a modification or an FOA message is posted by registering with FedConnect as an interested party for this FOA. It is recommended that you register as soon after release of the FOA as possible to ensure you receive timely notice of any modifications or other FOAs. More information is available at <http://www.fedconnect.net>.

B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE.

DOE reserves the right, without qualification, to reject any or all applications received in response to this FOA 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.

Applicants may request a waiver of all or any part of the rights of the United States in inventions conceived or first actually reduced to practice in performance of an agreement as a result of this FOA, in advance of or within 30 days after the effective date of the award. Even if such advance waiver is not requested or the request is denied, the recipient will have a continuing right under the award to request a waiver of the rights of the United States in identified inventions, i.e., individual inventions conceived or first actually reduced to practice in performance of the award. Any patent waiver that may be granted is subject to certain terms and conditions in 10 CFR 784.12, http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title10/10cfr784_main_02.tpl.

Domestic small businesses and domestic nonprofit organizations will receive the patent rights clause at 37 CFR 401.14, i.e., the implementation of the Bayh-Dole Act. This clause permits domestic small business and domestic nonprofit organizations to retain title to subject inventions. Therefore, small businesses and nonprofit organizations do not need to request a waiver.

H. NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES.

N/A

I. AVAILABILITY OF FUNDS.

Funds are not presently available for this award. The Government's obligation under this award is contingent upon the availability of appropriated funds from which payment for award purposes can be made. No legal liability on the part of the Government for any payment may arise until funds are made available to the Contracting Officer for this award and until the awardee receives notice of such availability, to be confirmed in writing by the Contracting Officer.