

**PROGRAM ANNOUNCEMENT
TO DOE NATIONAL LABORATORIES**



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

**Storage Systems and Input/Output (SSIO)
for Extreme Scale Science**

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Amendment: Non-Lab collaborator application instructions on Page 8.

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REGISTRATIONS

A. DOE Office of Science Portfolio Analysis and Management System (PAMS)

The DOE Office of Science performs many functions for DOE national laboratory proposals in the Portfolio Analysis and Management System (PAMS), which is available at <https://pamspublic.science.energy.gov>.

There are many activities that you can perform in PAMS, and more functionality will be added throughout the near future. DOE national laboratories will submit preproposals, letters of intent, and proposals directly into PAMS.

You must register in PAMS to submit a preproposal, letter of intent, or DOE national laboratory proposal.

To access PAMS, you may use the Internet Explorer, Firefox, Google Chrome, or Safari browsers.

Notifications sent from the PAMS system will come from the PAMS email address <PAMS.Autoreply@science.doe.gov>. Please make sure your email server/software allows delivery of emails from the PAMS email address to yours.

Registering to PAMS is a two-step process; once you create an individual account, you must associate yourself with (“register to”) your institution. Detailed steps are listed below.

1. CREATE PAMS ACCOUNT:

To register, click the “Create New PAMS Account” link on the website <https://pamspublic.science.energy.gov/>.

- Click the “No, I have never had an account” link and then the “Create Account” button.
- You will be prompted to enter your name and email address, create a username and password, and select a security question and answer. Once you have done this, click the “Save and Continue” button.
- On the next page, enter the required information (at least one phone number and your mailing address) and any optional information you wish to provide (e.g., FAX number, website, mailstop code, additional email addresses or phone numbers, Division/Department). Click the “Create Account” button.
- Read the user agreement and click the “Accept” button to indicate that you understand your responsibilities and agree to comply with the rules of behavior for PAMS.
- PAMS will take you the “Having Trouble Logging In?” page. (Note: If you reviewed for or were listed as PI on a prior submission to the Office of Science but have not previously created an account, you may already be linked to an institution in PAMS. If this is the case, PAMS will take you to the PAMS home page.)

2. REGISTER TO YOUR INSTITUTION:

- Click the link labeled “Option 2: I know my institution and I am here to register to the institution.” (Note: If you previously created a PAMS account but did not register to an institution at that time, you must click the Institutions tab and click the “Register to Institution” link.)
- PAMS will take you to the “Register to Institution” page.
- Type a word or phrase from your institution name in the field labeled, “Institution Name like,” choose the radio button next to the item that best describes your role in the system, and click the “Search” button. A “like” search in PAMS returns results that contain the word or phrase you enter; you need not enter the exact name of the institution, but you should enter a word or phrase contained within the institution name. (Hint: If your institution has an acronym, such as ANL for Argonne National Laboratory or UCLA for the Regents of the University of California, Los Angeles, you may search for the acronym under “Institution Name like.” Many institutions with acronyms are listed in PAMS with their acronyms in parentheses after their names.)
- Find your institution in the list that is returned by the search and click the “Actions” link in the Options column next to the institution name to obtain a dropdown list. Select “Add me to this institution” from the dropdown. PAMS will take you to the “Institutions – List” page.
- If you do not see your institution in the initial search results, you can search again by clicking the “Cancel” button, clicking the Option 2 link, and repeating the search.
- All DOE National Laboratories have established profiles in PAMS, so please keep searching until you find your laboratory.

For help with PAMS, click the “External User Guide” link on the PAMS website, <https://pamspublic.science.energy.gov/>. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, Email: sc.pams-helpdesk@science.doe.gov. All submission and inquiries about this DOE National Laboratory Announcement should reference **LAB 15-1338**.

RECOMMENDATION

The Office of Science encourages you to register in all systems as soon as possible. You are also encouraged to submit preproposals and proposals before the deadline.

Section I – DOE NATIONAL LABORATORY OPPORTUNITY DESCRIPTION

GENERAL INQUIRIES ABOUT THIS ANNOUNCEMENT SHOULD BE DIRECTED TO:

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SUMMARY

The processing capability of computing systems, especially supercomputers, continues to increase rapidly. Within 10 years, exascale platforms will increase computational performance by a factor of at least 100 compared to 2015's 10-petaflop systems and they will support billion-way concurrency. However, improvement in the performance and capacity of storage systems and input/output (SSIO) bandwidth have lagged considerably, so that available storage and input/output bandwidth on exascale platforms will increase by only a factor of three compared to current technology. Improvements in storage efficiency will be achieved in part by increasing the complexity of the memory hierarchy to include non-volatile random access memory (NVRAM), which significantly complicates use of the system by scientists.

These trends combine to force significant changes in the workflow for computational science, which must shift from saving data for post-hoc analysis to incorporating various forms of data analysis and visualization during the run of a simulation, with comparatively little data saved for post-hoc analysis. These workflow changes require significant modifications to the way data are accessed and manipulated on the supercomputer, as well as how data are stored. Other science user facilities are similarly affected by SSIO limitations, with increasingly severe data reduction required for experimental/observational research projects.

Furthermore, as we look towards the extreme scale era, storage systems will become so large in numbers of devices/parts that we can no longer assume that existing designs of system components can be counted on to always be available and never lose/damage data. New designs are needed to meet extreme scale science requirements for usability, scalability and reliability.

To address these concerns, the Office of Advanced Scientific Computing Research (ASCR) invites computer science research proposals to address three themes:

1. Measurement and Understanding of Storage Systems and Input/Output Challenges;
2. Scalable Storage Software Infrastructure; and
3. New Paradigms in Storage Systems and Input/Output.

Additional details are in the section on Supplementary Information.

SUPPLEMENTARY INFORMATION

Program Objective

This Announcement has three primary objectives for the research to be supported:

- To enhance our understanding of the challenges DOE scientists and user facilities face with respect to SSIO and related performance issues;
- To support design and prototyping of next-generation SSIO environments, including storage systems software and middleware; and
- To initiate exploratory research on new SSIO design alternatives to meet the challenges of extreme scale science.

To meet these objectives, the Office of Advanced Scientific Computing Research (ASCR) invites computer science research proposals to address three themes:

1. Measurement and Understanding of Storage Systems and Input/Output Challenges;
2. Scalable Storage Software Infrastructure; and
3. New Paradigms in Storage Systems and Input/Output.

Additional information about these themes is below.

Background

The scientific discovery process increasingly involves complex sequences of steps that take advantage of multiple sources of data and benefit from different types of compute and data resources. The term *workflow* refers to sequencing and orchestrating operations, along with the attendant tasks of, for example, moving data between workflow processing stages. *Workflow management systems* aid in the automation of these processes, freeing the scientist from the details of the process.

The processing capability of computing systems, especially supercomputers, continues to increase rapidly. Within 10 years, exascale platforms will increase computational performance by at least a factor of 100 compared to 2015's 10-petaflop systems and they will support billion-way concurrency. [1,2, and 3] However, improvement in the performance and capacity of storage systems and input/output (SSIO) bandwidth have lagged considerably, so that available storage and input/output bandwidth on exascale platforms will increase by only a factor of three compared to current technology. Improvements in storage efficiency will be achieved in part by increasing the complexity of the memory hierarchy to include non-volatile random access memory (NVRAM), which significantly complicates use of the system by scientists. Industry representatives indicate that the memory hierarchy may have as many as 10 different layers with different performance characteristics across them.

These trends combine to force significant changes in the workflow for computational science, which must shift from saving data for post-hoc analysis to incorporating various forms of data analysis and visualization during the run of a simulation, with comparatively little data saved for post-hoc analysis. These workflow changes require significant modifications to the way data are accessed and manipulated on the supercomputer, as well as how data are reduced and stored. [1,

2, 3, and 4, and 5] Other science user facilities are similarly affected by SSIO limitations, with increasingly severe data reduction required for experimental/observational research projects. [6, 7, and 8,]

Furthermore, as we look towards the extreme scale era, storage systems will become so large in numbers of devices/parts that we can no longer assume that existing designs of system components can be counted on to always be available and never lose/damage data. New designs are needed to meet exascale requirements for usability, scalability and reliability. [9]

User facilities that are supported by other offices also face problems related to data volume and velocity in comparison the capacity of storage systems and I/O bandwidth. For example, recording every collision at the Large Hadron Collider (LHC) would require writing out almost a petabyte per second. The LHC uses hardware triggers to identify only the most energetic events to store for analysis, but it has nonetheless already accumulated data sets in excess of 10's of petabytes of observational data, with an equivalent amount of simulation data. By the mid-2020's, the LHC is expected to be dealing with exabytes of data. [6] Additional examples spanning multiple science disciplines are in [6].

To better understand requirements for improving SSIO, DOE held a series of workshops on the subject during December 2014. [9] Potential applicants are strongly encouraged to read this report.

Workshop findings, which are detailed in the report, are as follows:

- The inclusion of solid state and new disk-based storage layers is dramatically complicating the storage hierarchy. Standard methods (e.g., parallel file systems, archival storage management systems) of storage organization must dramatically change, if not be replaced, to provide effective SSIO for future platforms.
- To work productively, scientists need an integrated, coherent view of the storage resources at their disposal and a common method of managing and accessing data on these resources. Meeting this need will require new metadata capabilities and integration with external storage in conjunction with improvements in SSIO architectures.
- Scientists desire increasingly complex and specialized data abstractions that improve their productivity and the quality of their science, but significant improvements in SSIO data abstractions and their representations in the storage system are required to support these teams and simplify upper layers of the stack.
- Current SSIO designs are hindered by their isolation from system-level resource management, monitoring, and workflow systems. Cooperation with these critical system services will be mandatory for the success of SSIO in future platforms.
- Many important aspects of application and system behavior related to SSIO are obscured from view. Recent successes in capturing application SSIO behavior have highlighted the value of this type of data in performance debugging, system procurement, and steering SSIO research, but a better understanding of behavior is critical to SSIO effectiveness.

The report also states, “*Systems in the FY18-19 timeframe will have core counts in the 10-100s of millions and incorporate in-system nonvolatile storage; SSIO technologies must be developed and productized to meet science needs on these systems. Systems in the FY20-21 timeframe will have an order of magnitude more cores and possibly even deeper storage hierarchies, again mandating rapid development and productization of SSIO technologies.*”

Research Themes of Interest

To address these needs and a variety of concerns described below, ASCR invites Computer Science research proposals to address three themes, which are further described below:

1. Measurement and Understanding of Storage Systems and Input/Output Challenges;
2. Scalable Storage Software Infrastructure; and
3. New Paradigms in Storage Systems and Input/Output.

For the purposes of this Announcement, high priority research, development, and productization activities in SSIO broadly fall into the following categories, which are described in more detail in subsequent sections:

- **Measurement and Understanding of Storage Systems and Input/Output Challenges**
Workload characterization, emulation, and understanding; micro-applications that capture current application SSIO patterns/flows, automated tools for workload characterization like I/O kernel extraction, automated workload characterization; end to end modeling and simulation of SSIO stacks; and benchmarks
- **Scalable Storage Software Infrastructure** – System software responsible for the reliable storage and retrieval of data supporting checkpointing (i.e., the storage of simulation state for the purpose of restarting computation in the event of a failure), data generation, and data analysis I/O workloads, as well as workload driven understandable SSIO systems designs
- **New Paradigms in Storage Systems and Input/Output** – Design of fundamentally simpler SSIO environments and/or exploratory research on new paradigms in SSIO that move away from the file metaphor to better serve the semantics of science and/or beyond POSIX while still providing POSIX tolerance.

The desired outcome for this research portfolio is to guide development and ensure availability of one or more production-grade exascale storage infrastructures, from application interfaces to low-level storage organization, which meet requirements for performance and resilience and include a capability to manage complex exascale storage hierarchies. Ideally, breakthrough revolutionary concepts/methods will begin to be adopted by industry in the FY20-23 timeframe for Post-Exascale solutions.

Theme 1: Measurement and Understanding of Storage Systems and Input/Output Challenges

Research is needed on a variety of topics aimed at helping storage system software designers, users and system administrators better understand the behavior of SSIO systems under various workloads and to support design of new SSIO systems.

To this end, proposals are invited that address research challenges including, but not limited to, the following:

- Quantitative tools for analysis of SSIO system behavior; design and development of correctness and performance tools for SSIO systems, including layered performance measurement, tracing and visualization of performance data;
- Automated workload characterization, IO kernel extraction, and/or SSIO benchmark design and development;

- Development of formal failure models for SSIO systems;
- End-to-end modeling and simulation of SSIO system behavior to support exploration of the design space; trying new workloads, new concepts, and new technologies, all virtually, including:
 - Automated development/extraction of models from codes, runtime, traces, etc.
 - Modeling reliability of SSIO systems and for exploring failure modes/domains;
 - Modeling and simulation to support exploration of the design space of new SSIO systems;
 - Composable models that include applications, networks, and SSIO systems;
 - Modeling and simulation to enable study of SSIO systems over long time periods;
 - Rich abstract storage models that capture the relevant properties of future SSIO architectures, incorporating notions of locality, multiple tiers, as well as traditional properties such as mean time between failures (MTBF), capacity, and bandwidth; and/or
 - SSIO model verification;
- Methods for presenting views of current system state, using these models to support improved understanding SSIO architectures; and/or
- Understanding future SSIO workloads.

Theme 2: Scalable Storage Software Infrastructure

Today's state of the art in SSIO includes traditional parallel file systems and a small collection of middleware tools being used for in-system storage management for fault tolerance and data sharing/code coupling. The underpinnings of current high performance computing (HPC) storage system infrastructure are rooted in decade-old designs. This infrastructure includes everything from the low-level parallel file system and archival storage up to libraries that serve as the interfaces to applications and provide format interoperability, as well as software that monitors and reports on the utilization of the storage system. In use for years, the solutions currently in production have become cumbersome. Deeper storage hierarchies, a demand for greater resilience, and increasing scale mandate revisiting these designs.

Furthermore, the scale of storage systems will be so large that current designs cannot be counted on to remain highly available and not lose or damage data. Increasing scale will also require new interfaces and capabilities to address bottlenecks and to enable in situ/transit active data manipulation to minimize retained data volume and data movement.

Invited are proposals that address challenges in the design and preliminary prototyping of new SSIO infrastructure to meet the challenges of extreme scale science, including middleware and libraries, deeper and more complex storage hierarchies, resilience of SSIO systems, and workload-driven understandable SSIO systems designs. Challenges to be addressed include but not limited to the following:

- Approaches to improve the ability of SSIO software to support checkpoint/restart;
- Improving the resilience of SSIO software systems;
- Approaches to data abstractions that are optimized to support data models, scientific codes and analysis tools, including data semantics and relationships among data;

- Approaches to mapping complex science data models onto hierarchical storage architectures, including both different ways to organize data and metadata on storage and different methods for finding that data;
- Exposing information about how applications use the storage architecture, with an eye to identifying bottlenecks and understanding tradeoffs in storage system design and useage;
- Mechanisms for data movement across the memory/storage hierarchy, including incremental data movement, so that data can be effectively positioned for computation;
- Methods and/or tools to support improved understanding of SSIO architectures and the behavior thereof;
- Approaches to extend the interaction of IO middleware with the resource management system for allocation and reallocation of resources at runtime, including support for IO middleware operation beyond the scope of a single job; and/or
- Approaches to the design and implementation of advanced IO middleware architectures, including how multiple layers of middleware can be composed and coordinate efficiently with one another and with users, how security can be managed for multiuser IO middleware, and how faults and fault domains are managed and reported.

Theme 3: New Paradigms in Storage Systems and Input/Output

Key-value stores, storage methods that manage multiple representations to accelerate specific access patterns, scientific databases, object stores of various types, and methods for managing data in the system to facilitate sharing of data between jobs are all promising techniques being explored in other venues. They may have potential for accelerating scientific data analysis tasks. Similarly, alternative methods of finding data of interest are being successfully employed outside of the HPC space. The merits of these methods in the context of HPC and experimental/ observational data (EOD) must be understood and extensions to these methods developed to accelerate science. Improving the performance of our systems in the context of concurrent access may require alternative approaches to storage semantics such as transactions, optimistic methods, and speculative execution that are in need of additional study. Invention of completely new methods may also be appropriate.

Proposals are invited that address topics including, but not limited to:

- Longer-term paradigm-changing R&D to produce data management services that provide for today's data movement and storage capabilities and also future data management/ manipulation capabilities in a fundamentally simpler way than the current extremely complex and deep IO software stack; and/or
- Exploratory research on new paradigms in SSIO that move away from the file metaphor and/or beyond POSIX while still providing POSIX tolerance.

Out of Scope

Given funding constraints, a variety of important topics are out of scope for this Announcement, though we hope to address some of them in subsequent announcements. For this Announcement, topics that are out of scope include:

- Design and development of *in situ* and/or distributed workflow management systems, including provenance capture/management/reuse;

- Resilience, except as it pertains to the resilience of the SSIO system itself and its ability to support checkpoint/restart;
- Except for the design of APIs, programming language/model/environment extensions, including domain-specific languages, to support management of data, storage systems, and IO;
- Research aimed at the design of storage system hardware devices and/or memory hardware, including co-design of same; and
- Except to improve understanding of storage systems themselves, research on analysis and visualization of scientific data, both *in situ* and *post hoc*, including research in the use of Active Storage.

Proposals that fail to address SSIO challenges in the context of extreme scale science and compute platforms are out of scope, as are cloud storage approaches that are outside the DOE scientific research infrastructure.

Additional Information

More detailed information about specific SSIO challenges of interest for this Announcement may be found in [9].

Current ASCR-supported SSIO research is described at [10].

Related resilience challenges are described in [11, 12, 13, and 14].

Descriptions of the science workflows and data rates at DOE user facilities and the related data management needs and challenges may be found in a variety of reports, including [6, 7, 9, 15, 16 NERSC Target 2017 reports 17-21].

Requirements related to data intensive science in the exascale era are described in [4, 5, 6, 7, 9, and 16]

Information about SSIO systems for HPC may be found in [9, 15, 22 and 23].

Information about research on extreme scale computing systems may be found at [1, 2, 3, and 23].

Additional information about the expected hardware architectures for the extreme scale era may be found here: <http://www.cal-design.org/>.

Additional Requirements

A proposal may address **only one of the Announcement themes**. Preference will be given to projects that offer focused and coherent research and solutions. All projects should be appropriately integrated into a whole and not a collection of disjointed efforts.

Proposals must explicitly address the challenges of operating within the expected exascale environment, including severe constraints on data movement, worsening IO bottleneck, frequent hard and soft faults, and the necessity for extremely high levels of concurrency.

Proposed research must advance pertinent aspects of computer science.

All recipients of awards resulting from this FOA must comply with the terms of the ASCR policy on open source software:

http://science.energy.gov/~media/ascr/pdf/research/docs/Doe_lab_developed_software_policy.pdf

Data Management Plan

Consistent with the Office of Science Statement on Digital Data Management, each proposal must include a Data Management Plan. The Statement may be found here:

<http://science.energy.gov/funding-opportunities/digital-data-management/>. ASCR-specific guidance about Data Management Plans is provided at <http://science.energy.gov/ascr/funding-opportunities/digital-data-management/>.

Annual Meetings

The proposed budget should include provision to support participation in a kick-off Principal Investigators (PI) Meeting and annual PI meetings thereafter. Award recipients may also be invited to participate in Extreme Scale Research PI meetings, which are expected to occur annually.

Collaboration

Collaborative proposals submitted from different institutions must clearly indicate they are part of a collaborative project/group. Every partner Laboratory must submit a proposal through its own sponsored research office. Each collaborative group can have only one Lead institution. Each proposal within the collaborative group, including the narrative and all required appendices and attachments, must be identical with the following exceptions:

- Each proposal must contain a correct cover page for the submitting institution only.
- Each proposal must contain a unique budget corresponding to the expenditures for that proposal's submitting institution only.
- Each proposal must contain a unique budget justification corresponding to the expenditures for that proposal's submitting institution only. For budgets that include sub-awards, justification for the sub-awards must be included.

Our intent is to create from the various proposals associated with a collaborative group one document for merit review that consists of the common, identical proposal materials combined with a set of detailed budgets from the partner institutions. Thus, it is very important that every proposal in the collaborative group be identical (including the title) with the exception of the budget and budget justification pages.

For the purposes of this Announcement, non-Laboratory collaborators with DOE National Laboratory leads are encouraged to apply on a sub-award basis to ensure that all collaborating institutions can begin in the same timeframe. In this case, their activities, participants and budgets should be included within the leading Laboratory proposal.

However, non-Laboratory collaborators (i.e., universities, not-for profits, and industry applicants) may also apply separately through DE-FOA-0001338, with the caution that their award start dates may be in the spring of 2016.

DOE National Laboratories that propose collaboration with a non-Laboratory led project should apply separately through this Announcement, while the non-Laboratory lead and non-Laboratory collaborating institutions should be submitted following the above rules in response to the companion Announcement, DE-FOA-0001338. Each proposal within the collaborative group

submitted in response to an FOA, including the narrative and all required appendices and attachments, must be identical with the following exceptions:

- Each proposal must contain a correct SF-424 (R&R) cover page for the submitting institution only.
- Each proposal must contain a unique budget corresponding to the expenditures for that proposal's submitting institution only.
- Each proposal must contain a unique budget justification corresponding to the expenditures for that proposal's submitting institution only.

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<http://institute.lanl.gov/resilience/docs/IBM%20Mootaz%20White%20Paper%20System%20Resilience.pdf>
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<http://www.mcs.anl.gov/papers/P5022-0913.pdf>
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20. *NERSC Large Scale Computing and Storage Requirements for Basic Energy Sciences: Target 2017*, October 8-9, 2013.
<http://science.energy.gov/~media/ascr/pdf/facilities/NERSC/2015/NerscBES2017ReqRevFinal.pdf>
21. *NERSC Large Scale Computing and Storage Requirements for Advanced Scientific Computing Research: Target 2017*, January 5-6, 2011.
<http://science.energy.gov/~media/ascr/pdf/facilities/NERSC/2015/NERSC-ASCR-WorkshopReport.pdf>
22. *The Fifth Workshop on HPC Best Practices: File Systems and Archives*, San Francisco, CA, Sept. 26-27, 2011. <http://science.energy.gov/~media/ascr/pdf/program-documents/docs/5BPWS-report.pdf>
23. Extreme Scale Research Conference 2012 materials,
<http://exascalerresearch.labworks.org/oct2012/>

Section II – AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT

DOE anticipates awarding laboratory work authorizations under this DOE National Laboratory Program Announcement.

DOE will consider funding multi-institution collaborations under this LAB Announcement.

B. ESTIMATED FUNDING

It is anticipated that approximately \$4,000,000 per year will be available under this DOE National Laboratory Announcement and the companion FOA DE-FOA-0001338, contingent on satisfactory peer review and the availability of appropriated funds. Applicants should request project support for three years. Following the first year award, out-year support will be contingent on the availability of appropriated funds, progress of the research, and programmatic needs.

DOE is under no obligation to pay for any costs associated with the preparation or submission of an proposal. DOE reserves the right to fund, in whole or in part, any, all, or none of the proposals submitted in response to this DOE National Laboratory Announcement.

C. MAXIMUM AND MINIMUM AWARD SIZE

(See B. ESTIMATED FUNDING section above and E. ANTICIPATED AWARD SIZE below.)

For the purposes of this Announcement, a “project” is a body of research that may be performed at one or more institutions. An “award” is funding for a body of research that is disbursed to a single organization, which may or may not make sub-awards to collaborators. A project may span multiple awards, while an award is associated with a particular project.

Maximum size for projects that include at least one DOE National Laboratory: \$1,250,000 per year for 3 years, including any and all collaborating institutions.

Maximum size for projects that do not include a DOE National Laboratory: \$500,000 per year for 3 years.

The actual award size will depend on the number of meritorious proposals and the availability of appropriated funds.

D. EXPECTED NUMBER OF AWARDS

(See B. Estimated Funding Section above.)

Approximately 4-6 projects are expected to be funded, depending on proposal quality and availability of funds

The exact number of awards will depend on the number of meritorious proposals and the availability of appropriated funds.

E. ANTICIPATED AWARD SIZE

(See B. Estimated Funding Section above.)

Awards for proposals submitted to LAB 15-1338 are expected to range between \$200,000 and \$1,250,000 per year for 3 years.

The actual award size will depend on the number of meritorious proposals and the availability of appropriated funds.

F. PERIOD OF PERFORMANCE

(See B. Estimated Funding section above.)

DOE anticipates making awards with a project period of 3 years.

Continuation funding (funding for the second and subsequent budget periods) is contingent on: (1) availability of funds appropriated by Congress and future year budget authority; (2) progress towards meeting the objectives of the approved proposal; (3) submission of required reports; and (4) compliance with the terms and conditions of the award.

G. TYPE OF PROPOSAL

DOE will accept new and renewal DOE National Laboratory Proposals under this DOE National Laboratory Announcement. Please only submit a PAMS lab technical proposal in response to this Announcement; do not submit a DOE Field Work Proposal (FWP) at this time. The Office of Science will request FWPs later from those selected for funding consideration under this Announcement.

Section III – ELIGIBILITY INFORMATION

A. ELIGIBLE APPLICANTS AND TOPICS

This is a DOE National Laboratory-only Announcement. FFRDCs from other Federal agencies are not eligible to submit in response to this Program Announcement.

Each DOE National Laboratory may submit at most four proposals as the Lead institution. There is no limit on the number of proposals that may be submitted as a Collaborator institution.

An individual researcher may participate in at most three full proposals as a Principal Investigator, Co-Principal Investigator, or Senior Personnel.

There is no limit on the number of preproposals that may be submitted and/or encouraged, but a Laboratory will have to decline participation in one or more encouraged full proposals if more than four are encouraged.

Proposed research should be included in only one proposal.

B. COST SHARING

Cost sharing is not required.

C. ELIGIBLE INDIVIDUALS

Eligible individuals with the skills, knowledge, and resources necessary to carry out the proposed research as a Lead Principal Investigator/Principal Investigator are invited to work with their organizations to develop a proposal. Individuals from underrepresented groups as well as individuals with disabilities are always encouraged to apply.

Section IV – PROPOSAL AND SUBMISSION INFORMATION

A. ADDRESS TO REQUEST PROPOSAL PACKAGE

Proposal submission instructions are available in this Announcement on the DOE Office of Science Portfolio Analysis and Management System (PAMS). Screenshots showing the steps in DOE National Laboratory proposal submission are available in the PAMS External User Guide, accessible by navigating to <https://pamspublic.science.energy.gov> and clicking on the “PAMS External User Guide” link.

Proposals submitted outside of PAMS will not be accepted.

B. LETTER OF INTENT AND PREPROPOSAL

1. Letter of Intent – Not required.

LETTER OF INTENT DUE DATE

N/A

2. Preproposal

PREPROPOSAL DUE DATE

[See Section IV, Part E.](#)

ENCOURAGE/DISCOURAGE DATE

[See Section IV, Part E.](#)

A preproposal is required and must/should be submitted by the deadline specified in [Section IV, Part E](#). Only the Lead organization needs to submit a preproposal for a collaborative project.

Pre-preproposalproposals will be reviewed for responsiveness of the proposed work to the research topics identified in this FOA. DOE will send a response by email to each applicant encouraging or discouraging the submission of a full proposal by the Encourage/Discourage Date indicated in Section IV, Part E. Applicants who have not received a response regarding the status of their preproposal by this date are responsible for contacting the program to confirm this status.

Only those applicants that receive notification from DOE encouraging a full proposal may submit full proposals. No other full proposals will be considered.

The preproposal attachment should include, at the top of the first page, the following information:

Title of Preproposal

Principal Investigator Name, Job Title

Institution

PI Phone Number, PI Email Address

Laboratory Announcement Number: **LAB 15-1338.**

List of all co-PIs and Key/Senior Personnel, with their organizations.

This information should be followed by a clear and concise description of the objectives and technical approach of the proposed research. The preproposal may not exceed two pages, with a minimum text font size of 11 points and margins no smaller than one inch on all sides. Figures and references, if included, must fit within the two-page limit.

The preproposal must include a list of the full names and institutional affiliations of all participating investigators, including collaborators and consultants on the proposed project.

The preproposal must also **include a unified, alphabetized list of all conflicts of interest (COI)** that apply to the PI and any and all co-PIs and Senior Personnel across any and all participating institutions. The list, which will be used to screen potential reviewers, should include the full names and affiliations of collaborative co-investigators, including co-authors of the past 48 months, co-editors of the past 24 months, graduate and postdoctoral advisors/advisees, and close associations.

- For each COI, include the source of the conflict (e.g., co-author, collaborator, co-editor, graduate student, advisor).
- Please review the COI list to delete conflicts that have expired, as well as adding new conflicts.

The COI list **will not count in the preproposal** page limitation.

Those preproposals that are encouraged will be used to help the Office of Science begin planning for the full proposal peer review process. The intent of the Office of Science in discouraging submission of certain full proposals is to save the time and effort of applicants in preparing and submitting full proposals not responsive to this funding opportunity announcement.

The Principal Investigator will be automatically notified when the preproposal is encouraged or discouraged. The DOE Office of Science Portfolio Analysis and Management System (PAMS) will send an email to the Principal Investigator from PAMS.Autoreply@science.doe.gov, and the status of the preproposal will be updated at the PAMS website <https://pamspublic.science.energy.gov/>. Notifications are sent as soon as the decisions to encourage or discourage are finalized.

It is important that the preproposal be a single file with extension .pdf, .docx, or .doc. The preproposal must be submitted electronically through the DOE Office of Science Portfolio Analysis and Management System (PAMS) website <https://pamspublic.science.energy.gov/>. The Principal Investigator and anyone submitting on behalf of the Principal Investigator must register for an account in PAMS before it will be possible to submit a preproposal. All PIs and those submitting preproposals on behalf of PIs are encouraged to establish PAMS accounts as soon as possible to avoid submission delays.

You may use the Internet Explorer, Firefox, Google Chrome, or Safari browsers to access PAMS.

Registering to PAMS is a two-step process; once you create an individual account, you must associate yourself with (“register to”) your institution. Detailed steps are listed below.

Create PAMS Account:

To register, click the “Create New PAMS Account” link on the website

<https://pamspublic.science.energy.gov/>.

- Click the “No, I have never had an account” link and then the “Create Account” button.
- You will be prompted to enter your name and email address, create a username and password, and select a security question and answer. Once you have done this, click the “Save and Continue” button.
- On the next page, enter the required information (at least one phone number and your mailing address) and any optional information you wish to provide (e.g., FAX number, website, mailstop code, additional email addresses or phone numbers, Division/Department). Click the “Create Account” button.
- Read the user agreement and click the “Accept” button to indicate that you understand your responsibilities and agree to comply with the rules of behavior for PAMS.

PAMS will take you the “Having Trouble Logging In?” page. (If you have been an Office of Science merit reviewer or if you have previously submitted a proposal, you may already be linked to an institution in PAMS. If this happens, you will be taken to the PAMS home page.)

Register to Your Institution:

- Click the link labeled “Option 2: I know my institution and I am here to register to the institution.” (Note: If you previously created a PAMS account but did not register to an institution at that time, you must click the Institutions tab and click the “Register to Institution” link.)
- PAMS will take you to the “Register to Institution” page.
- Type a word or phrase from your institution name in the field labeled, “Institution Name like,” choose the radio button next to the item that best describes your role in the system, and click the “Search” button. A “like” search in PAMS returns results that contain the word or phrase you enter; you do not need to enter the exact name of the institution, but you should enter a word or phrase contained within the institution name. (If your institution has a frequently used acronym, such as ANL for Argonne National Laboratory or UCLA for the Regents of the University of California, Los Angeles, you may find it easiest to search for the acronym under “Institution Name like.” Many institutions with acronyms are listed in PAMS with their acronyms in parentheses after their names.)
- Find your institution in the list that is returned by the search and click the “Actions” link in the Options column next to the institution name to obtain a dropdown list. Select “Add me to this institution” from the dropdown. PAMS will take you to the “Institutions – List” page.
- If you do not see your institution in the initial search results, you can search again by clicking the “Cancel” button, clicking the Option 2 link, and repeating the search.
- If, after searching, you think your institution is not currently in the database, click the “Cannot Find My Institution” button and enter the requested institution information into PAMS. Click the “Create Institution” button. PAMS will add the institution to the system, associate your profile with the new institution, and return you to the “Institutions – List” page when you are finished.

Submit Your Preproposal:

- Create your preproposal (called a preproposal in PAMS) outside the system and save it as a file with extension .docx, .doc, or .pdf. Make a note of the location of the file on your computer so you can browse for it later from within PAMS.
- Log into PAMS and click the Proposals tab. Click the “View / View / Respond to DOE National Laboratory Announcements” link and find the current announcement in the list. Click the “Actions/Views” link in the Options column next to this announcement to obtain a dropdown menu. Select “Submit Preproposal” from the dropdown.
- On the Submit Preproposal page, select the institution from which you are submitting this preproposal from the Institution dropdown. If you are associated with only one institution in the system, there will only be one institution in the dropdown.
- Note that you must select one and only one Principal Investigator (PI) per preproposal; to do so, click the “Select PI” button on the far right side of the screen. Find the appropriate PI from the list of all registered users from your institution returned by PAMS. (Hint: You may have to sort, filter, or search through the list if it has multiple pages.) Click the “Actions” link in the Options column next to the appropriate PI to obtain a dropdown menu. From the dropdown, choose “Select PI.”
- If the PI for whom you are submitting does not appear on the list, it means he or she has not yet registered in PAMS. For your convenience, you may have PAMS send an email invitation to the PI to register in PAMS. To do so, click the “Invite PI” link at the top left of the “Select PI” screen. You can enter an optional personal message to the PI in the “Comments” box, and it will be included in the email sent by PAMS to the PI. You must wait until the PI registers before you can submit the preproposal. Save the preproposal for later work by clicking the “Save” button at the bottom of the screen. It will be stored in “My Preproposals” for later editing.
- Enter a title for your preproposal.
- Select the appropriate technical contact from the Program Manager dropdown.
- To upload the preproposal file into PAMS, click the “Attach File” button at the far right side of the screen. Click the “Browse” (or “Choose File” depending on your browser) button to search for your file. You may enter an optional description of the file you are attaching. Click the “Upload” button to upload the file.
- At the bottom of the screen, click the “Submit to DOE” button to save and submit the preproposal to DOE.
- Upon submission, the PI will receive an email from the PAMS system <PAMS.Autoreply@science.doe.gov> acknowledging receipt of the preproposal.

You are encouraged to register for an account in PAMS at least a week in advance of the preproposal submission deadline so that there will be no delays with your submission.

For help with PAMS, click the “External User Guide” link on the PAMS website, <https://pamspublic.science.energy.gov/>. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9 AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, email: sc.pams-helpdesk@science.doe.gov. All submission and inquiries about this Funding Opportunity Announcement should reference DE-FOA-0001338.

Preproposals submitted outside PAMS will not be considered. Preproposals may not be submitted through grants.gov or www.FedConnect.net.

C. CONTENT AND PROPOSAL FORMS

PROPOSAL DUE DATE

[See Section IV, Part E.](#)

Files that are attached to the forms must be in Adobe Portable Document Format (PDF) unless otherwise specified in this announcement. Attached PDF files must be plain files consisting of text, numbers, and images without editable fields, signatures, passwords, redactions, or other advanced features available in some PDF-compatible software. Do not attach PDF portfolios.

LETTERS

Letters of support should not be included. Letters of collaboration should be included for unfunded participants, if any.

1. Summary of Proposal Contents and Information about PAMS

Each DOE National Laboratory proposal will contain the following sections:

- Budget, entered into PAMS as structured data using the PAMS budget form
- Abstract (one page), entered into PAMS as a separate pdf
- Budget justification, entered into PAMS as a separate pdf
- Proposal, combined into a single pdf containing the following information:
 - Proposal Cover Page
 - Table of Contents
 - Project Narrative (main technical portion of the proposal, including background/introduction; proposed research, hypotheses and methods; timetable of activities; and responsibilities of key project personnel – 15 page limit; 22 pages for Collaborative proposals)
 - Appendix 1: Biographical Sketch(es)
 - Appendix 2: Current and Pending Support
 - Appendix 3: Bibliography and References Cited
 - Appendix 4: Facilities and Other Resources
 - Appendix 5: Equipment
 - Appendix 6: Data Management Plan
 - Appendix 7: Other Attachments (optional)

SUBMISSION INSTRUCTIONS

Full proposals must be submitted into the DOE Office of Science Portfolio Analysis and Management System (PAMS). For help with PAMS, click the “External User Guide” link on the PAMS website, <https://pamspublic.science.energy.gov/>. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9:00 AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free number) or (301) 903-9610, Email: sc.pams-helpdesk@science.doe.gov.

All submissions and inquiries about this Program Announcement should reference **LAB 15-1338**. Full proposals submitted in response to this Program Announcement must be submitted to PAMS no later than the **DEADLINE shown in Section IV, Part E**, at 5:00 PM Eastern Time.

All PIs and those submitting on behalf of PIs are encouraged to establish PAMS accounts as soon as possible to ensure timely submissions. To register, click “Create New PAMS Account” on the website <https://pamspublic.science.energy.gov/> and follow the instructions for creating an account.

The following information is provided to help with proposal submission. Detailed instructions and screen shots can be found in the user guide. To find the user guide, click the “External User Guide” link on the PAMS home page. Onscreen instructions are available within PAMS.

- Log into PAMS. From the proposals tab, click the “View DOE National Laboratory Announcements” link and find the current announcement in the list. Click the “Actions/Views” link in the Options column next to this Announcement to obtain a dropdown menu. Select “Submit Proposal” from the dropdown.
- Note that you must select one and only one Principal Investigator (PI) per proposal; to do so, click the “Select PI” button on the far right side of the screen. Find the appropriate PI from the list of all registered users from your institution returned by PAMS. (Hint: You may have to sort, filter, or search through the list if it has multiple pages.) Click the “Actions” link in the Options column next to the appropriate PI to obtain a dropdown menu. From the dropdown, choose “Select PI.”
- If the PI for whom you are submitting does not appear on the list, it means he or she has not yet registered in PAMS. For your convenience, you may have PAMS send an email invitation to the PI to register in PAMS. To do so, click the “Invite PI” link at the top left of the “Select PI” screen. You can enter an optional personal message to the PI in the “Comments” box, and it will be included in the email sent by PAMS to the PI. You must wait until the PI registers before you can submit the proposal. Save the proposal for later work by selecting “Save” from the dropdown at the bottom of the screen and then clicking the “Go” button. It will be stored in “My Proposals” for later editing. As a minimum, you must complete all the required fields on the PAMS cover page before you can save the proposal for the first time.
- The cover page, budget, and attachments sections of the lab proposal are required by PAMS before it can be submitted to DOE.
- Complete the sections in PAMS one at a time, starting with the cover page and following the instructions for each section.
- Click the “+View More” link at the top of each section to expand the onscreen instructions. On the budget section, click the “Budget Tab Instructions” link to obtain detailed guidance on completing the budget form.
- Save each section by selecting either “Save” (to stay in the same section) or “Save... and Continue to the Next Section” (to move to the next section) from the dropdown menu at the bottom of the screen, followed by clicking the “Go” button.
- If you save the proposal and navigate away from it, you may return later to edit the proposal by clicking the “View My Existing Proposals” or “My Proposals” links within PAMS.
- You must enter a budget for each annual budget period.

- You must also enter a budget for each proposed sub-award. The sub-award section can be completed using the same steps used for the budget section.
- In the attachments section of the lab proposal, the abstract, the budget justification, and the proposal narrative are required and must be submitted as separate files.
- You must bundle everything other than the budget, abstract, and budget justification into one single PDF file to be attached under “Proposal Attachment.”
- Do not attach anything under “Other Attachments.”
- To upload a file into PAMS, click the “Attach File” button at the far right side of the screen. Click the “Browse” (or “Choose File” depending on your browser) button to search for your file. You may enter an optional description of the file you are attaching. Click the “Upload” button to upload the file.
- Once you have saved all of the sections, the “Submit to DOE” option will appear in the dropdown menu at the bottom of the screen.
- To submit the proposal, select “Submit to DOE” from the dropdown menu and then click the “Go” button.
- Upon submission, the PI will receive an email from the PAMS system <PAMS.Autoreply@science.doe.gov> acknowledging receipt of the proposal.
- The proposal will also appear under My Proposals with a Proposal Status of “Submitted to DOE.”

Please only submit a PAMS lab technical proposal in response to this Announcement; do not submit a DOE Field Work Proposal (FWP) at this time. The Office of Science will request FWPs later from those selected for funding consideration under this Announcement.

For help with PAMS, click the “External User Guide” link on the PAMS website, <https://pamspublic.science.energy.gov/>. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9:00 AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free number) or (301) 903-9610, Email: sc.pams-helpdesk@science.doe.gov. All submissions and inquiries about this Program Announcement should reference **LAB 15-1338**.

2. Detailed Contents of the Proposal

BUDGET AND BUDGET EXPLANATION

The budget must be submitted into PAMS using the PAMS budget form. Research proposed under this Announcement may only have one annual budget period.

PAMS will calculate the cumulative budget totals for you.

A written justification of each budget item is to follow the budget pages. The budget justification should be placed in a separate, single pdf document and attached on the appropriate screen in PAMS. Further instructions regarding the budget and justification are given below and in the PAMS software.

PROJECT SUMMARY/ABSTRACT (NO MORE THAN ONE PAGE)

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 project title; the name of the applicant Laboratory; the Principal Investigator (PI); a list of all co-PIs (if any) and their organizations; the objectives of the project; a description of the project, including methods to be employed; and the potential impact of the project (i.e., benefits, outcomes). . The Project Abstract should be written so as to be comprehensible to an educated person who may not be an expert in Computer Science or the area of SSIO covered in the proposal. 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. The one-page project summary/abstract should be placed in a separate, single pdf document and attached on the appropriate screen in PAMS.

The abstract may be used to prepare publicly accessible reports about DOE-supported research.

DOE COVER PAGE (PART OF PROJECT NARRATIVE)

The following proposal cover page information may be placed on a plain page. No form is required. This cover page will not count in the project narrative page limitation.

- The project title:
- Applicant/Institution:
- Street Address/City/State/Zip:
- Postal Address:
- Administrative Point of Contact name, telephone number, email:
- Lead PI name, telephone number, email:
- The names and institutions for any co-Investigators and Senior Personnel;
- DOE National Laboratory Announcement Number: **LAB 15-1338.**
- DOE/Office of Science Program Office: **Advanced Scientific Computing Research**
- DOE/Office of Science Program Office Technical Contact: **Dr. Lucy Nowell**
- **PAMS Preproposal Tracking Number**
- Research theme identified in Section I of this Announcement

COVER PAGE SUPPLEMENT FOR COLLABORATIONS (PART OF PROJECT NARRATIVE ATTACHED TO FIELD 8 ON THE FORM)

Collaborative proposals submitted from different DOE National Laboratories must clearly indicate they are part of a collaborative project/group. Every partner Laboratory must submit a proposal through its own sponsored research office. Each collaborative group can have only one lead institution. Each proposal within the collaborative group, including the narrative and all required appendices and attachments, must be identical with one exception:

- Each proposal must contain the correct “cover-page” information for the submitting institution only.
- Each proposal must contain a unique budget corresponding to the expenditures for that proposal’s submitting institution only.
- Each proposal must contain a unique budget justification corresponding to the expenditures for that proposal’s submitting institution only.

The Office of Science will use the multiple proposals associated with a collaborative group to create one consolidated document for merit review that consists of the common, identical proposal materials combined with a set of detailed budgets from the partner institutions. It is very important that every proposal in the collaborative group be identical (including the title) with the exception of the budget and budget justification pages.

If the project is a collaboration, provide the following information **on a separate page** as a supplement to the cover page.

- List all collaborating institutions by name with each institution’s principal investigator on the same line. Additional institutions may not be added after the preproposal is submitted.
- Indicate the lead PI who will be the point of contact and coordinator for the combined research activity.
- Provide a statement explaining the leadership structure of the collaboration.
- Include a description of each collaborating institution’s facilities, equipment, and resources that will be made available to the collaborative group.
- Include a table modeled on the following chart providing summary budget information from all collaborating institutions. Provide the total costs of the budget request in each year for each institution and totals for all rows and columns.

Collaborative Proposal Information						
	Names	Institution	Year 1 Budget	Year 2 Budget	Year 3 Budget	Total Budget
Lead PI						
Co-PI						
Co-PI						
Co-PI						

Example budget table (\$ in thousands)

* Note that collaborating proposals must be submitted separately unless the collaborators are funded via sub-awards from the lead Laboratory.

PROJECT NARRATIVE (NO MORE THAN 15 PAGES LONG; 22 PAGES FOR COLLABORATIVE PROPOSALS)

The project narrative **must not exceed 15 pages** of technical information (**22 pages for Collaborative projects**), 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). The font must not be smaller than 11 point. Merit reviewers will only consider the number of pages specified in the first sentence of this paragraph. This page limit does not apply to the Cover Page, Budget Page(s), Budget Justification, biographical material, publications and references, and appendices, each of which may have its own page limit.

Do not include any Internet addresses (URLs) that provide supplementary or additional information that constitutes a part of the proposal. Merit reviewers are not required to access Internet sites; however, Internet publications in a list of references will be treated identically to print publications. See Part VIII.D for instructions on how to mark proprietary proposal information. To attach a Project Narrative, click “Add Attachment.”

Background/Introduction: Explanation of the importance and relevance of the proposed work as well as a review of the relevant literature. This section may be used to inform potential reviewers who may not be experts in the precise technical details of the proposed research.

Proposed Research and Methods: Identify the hypotheses to be tested (if any) and details of the methods to be used, including the integration of experiments with theoretical and computational research efforts.

Timetable of Activities: Timeline for all major activities including milestones and deliverables. Provision of a capability is a milestone; release of a version of software is not.

Project Management Plan: Multi-institutional proposals must include a project management plan that clearly indicates the roles and responsibilities of each organization and indicates how activities will be coordinated and communicated among team members.

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. The Project Narrative should be written so as to be comprehensible to an experienced scientist who may not be an expert in the area of SSIO covered in the proposal. 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. There should be no ambiguity about which personnel will perform particular parts of the project, and the time at which these activities will take place.

Do not include any Internet addresses (URLs) that provide supplementary or additional information that constitutes a part of the proposal. Using Internet sites in an attempt to avoid page limits will fail: The content of those sites will not be reviewed. See Part VIII.D for instructions on how to mark proprietary proposal information.

For Collaborative Proposals Only: Each collaborating institution must submit an identical common narrative. Collaborative proposals will necessarily be longer than single-institution proposals. **The common narrative may exceed the page limit described for the research narrative by 50%;** i.e., if the page limit is 12 pages, a collaboration is subject to a limit of 18 pages. The common narrative must identify which tasks and activities will be performed by which of the collaborating institutions in every budget period of the proposed project. The budget and the budget justification—which are unique to each collaborating institution—may refer to parts of the common narrative to further identify each collaborating institution’s activities in the joint project. There should be no ambiguity about each institution’s role and participation in the collaborative group.

The Office of Science will use the multiple proposals associated with a collaborative group to create one consolidated document for merit review that consists of the common, identical proposal materials combined with a set of detailed budgets from the partner institutions. It is very important that every proposal in the collaborative group be identical (including the title) with the exception of the budget and budget justification pages.

APPENDIX 1: BIOGRAPHICAL SKETCH

Provide a biographical sketch for the project director/principal investigator (PD/PI) and each senior/key person as an appendix to your technical narrative. A senior/key person is one who contributes to the intellectual content of the proposal and research, whether or not that person serves as co-PI. As part of the sketch, provide information that can be used by reviewers to evaluate the PI’s potential for leadership within the scientific community and ability to manage the project effectively. Examples of information of interest are previous scientific accomplishments and best-paper awards; invited and/or public lectures; awards received; scientific program committee participation; conference or workshop organization; professional society activities; international or industrial partnerships; reviewing or editorship activities; or other scientific leadership experiences. The biographical information (curriculum vitae) 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 the following:

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 reverse chronological order, professional/academic positions with a brief description of responsibilities.

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. An abbreviated style such as the Physical Review Letters (PRL) convention for citations (list only the first author) may be used for publications with more than ten authors.

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

Identification of Potential Conflicts of Interest (COI) 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 first and last names and current organizational affiliation, who are, or who have been, collaborators or co-authors with you on a research project, book or book article, report (other than workshop reports with more than 10 authors/contributors), abstract, or paper during the 48 months preceding the submission of this proposal. For publications or collaborations with more than 10 authors or participants, only list those individuals in the core group with whom the individual 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 proposal. For each COI, include the source of the conflict (e.g., co-author, collaborator, co-editor, graduate student, advisor). 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). Also, list the names and current organizational affiliations of your graduate students and postdoctoral associates.
- For each COI, include the source of the conflict (e.g., co-author, collaborator, co-editor, graduate student, advisor).
- Please review the COI list to delete conflicts that have expired, as well as adding new conflicts.
- The COI list may require additional pages beyond the three-page limit.

In addition to the individual COI lists, **each proposal should include a unified, alphabetized list of all COIs** that apply to the PI and any and all co-PIs and senior/key personnel.

Personally Identifiable Information: Do not include sensitive personally identifiable information such as a Social Security Number, date of birth, or city of birth. Do not include information that a merit reviewer should not consider.

This appendix will not count in the project narrative page limitation.

APPENDIX 2: CURRENT AND PENDING SUPPORT

Provide a list of all current and pending support (both Federal and non-Federal) for the lead principal investigator and each principal investigator, including subawardees, for ongoing projects and pending proposals. 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 PI. Include the award number, title of the funded research project, and the name of the PI for the project. Briefly describe the research being performed and explicitly identify any overlaps with the proposed research.

Provide the Current and Pending Support as an appendix to your project narrative. Concurrent submission of an proposal to other organizations for simultaneous consideration will not prejudice its review.

- Do not attach a separate file.
- This appendix will not count in the project narrative page limitation.

APPENDIX 3: BIBLIOGRAPHY & 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. For research areas where there are routinely more than ten coauthors of archival publications, you may use an abbreviated style such as the Physical Review Letters (PRL) convention for citations (listing only the first author). For example, your paper may be listed as, “A Really Important New Result,” A. Aardvark et. al. (MONGO Collaboration), PRL 999. 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 proposal. Provide the Bibliography and References Cited information as an appendix to your project narrative.

- Do not attach a separate file.
- This appendix will not count in the project narrative page limitation.

APPENDIX 4: FACILITIES & 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. For proposed investigations requiring access to experimental user facilities maintained by institutions other than the applicant, please provide a document from the facility manager confirming that the researchers will have access to the facility. Please provide the Facility and Other Resource information as an appendix to your project narrative.

- Do not attach a separate file.
- This 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.
- This appendix will not count in the project narrative page limitation.

APPENDIX 6: DATA MANAGEMENT PLAN

Provide a Data Management Plan (DMP) that addresses the following requirements:

1. DMPs should describe whether and how data generated in the course of the proposed research will be shared and preserved. If the plan is not to share and/or preserve certain data, then the plan must explain the basis of the decision (for example, cost/benefit considerations, other parameters of feasibility, scientific appropriateness, or limitations discussed in #4). At a minimum, DMPs must describe how data sharing and preservation will enable validation of results, or how results could be validated if data are not shared or preserved.
2. DMPs should provide a plan for making all research data displayed in publications resulting from the proposed research digitally accessible to the public at the time of publication. This includes data that are displayed in charts, figures, images, etc. In addition, the underlying digital research data used to generate the displayed data should be made as accessible as possible to the public in accordance with the principles stated in the Office of Science Statement on Digital Data Management (<http://science.energy.gov/funding-opportunities/digital-data-management/>). This requirement could be met by including the data as supplementary information to the published article, or through other means. The published article should indicate how these data can be accessed.
3. DMPs should consult and reference available information about data management resources to be used in the course of the proposed research. In particular, DMPs that explicitly or implicitly commit data management resources at a facility beyond what is conventionally made available to approved users should be accompanied by written approval from that facility. In determining the resources available for data management at Office of Science User Facilities, researchers should consult the published description of data management resources and practices at that facility and reference it in the DMP. Information about other Office of Science facilities can be found in the additional guidance from the sponsoring program.
4. DMPs must protect confidentiality, personal privacy, Personally Identifiable Information, and U.S. national, homeland, and economic security; recognize proprietary interests, business confidential information, and intellectual property rights; avoid significant negative impact on innovation, and U.S. competitiveness; and otherwise be consistent with all applicable laws, regulations, and DOE orders and policies. There is no requirement to share proprietary data.
5. ASCR-specific guidance about DMPs may be found at <http://science.energy.gov/ascr/funding-opportunities/digital-data-management/>

DMPs will be reviewed as part of the overall Office of Science research proposal merit review process. Applicants are encouraged to consult the Office of Science website for further information and suggestions for how to structure a DMP: <http://science.energy.gov/funding-opportunities/digital-data-management/>

- This appendix should not exceed 2 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)
- Do not attach a separate file.
- This appendix will not count in the project narrative page limitation.

APPENDIX 7: 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. Information not easily accessible to a reviewer may be included in this appendix, but do not use this appendix to circumvent the page limitations of the proposal. Reviewers are not required to consider information in this appendix.

- Do not attach a separate file.
- This appendix will not count in the project narrative page limitation.

3. Detailed Instructions for the Budget

Budgets are required for the entire project period. A budget form should be completed for each budget period of the award, and a cumulative budget form for the entire project period will be populated by PAMS. A detailed budget justification narrative should be included after the budget pages. The justification should cover labor, domestic travel, equipment, materials and supplies, and anything else that will be covered with project funds.

To edit a section on the budget, click the edit icon () for each section on the page. Remember to save all budget periods before moving on to the next section. You can save the budget periods by selecting “Save All Budget Periods” from the dropdown on the lower right corner of the PAMS budget entry screen and then clicking the “Go” button. You can also save any data entry page in PAMS using the blue diskette icon () in the floating toolbar on the bottom of the screen.

The budget in the full proposal may differ from the budget in the preproposal.

Section A. Senior/Key Person (Required)

For each Senior/Key Person, enter the appropriate information. List personnel, salary funds, and the number of months that person will be allocated to the project. This is the same as the period of performance for the project *only* for someone who has no other duties or support. Also include a written narrative in the budget justification that fully justifies the need for requested personnel. Senior/Key personnel may not be named in a submitted proposal if they were not named in the related preproposal. However, the need for unnamed personnel with particular qualifications may be documented in the proposal and the budget even if this was not addressed in the preproposal..

Section B. Other Personnel

List personnel, salary funds, and the number of months that person will be allocated to the project. Also include a written narrative in the budget justification that fully justifies the need for requested personnel.

Additional personnel may not be named in a submitted full proposal if they were not named in the related preproposal. However, the need for unnamed personnel with particular qualifications may be documented in the proposal and the budget even if this was not addressed in the preproposal.

Section C. Equipment Description

For the purpose of this budget, equipment is designated as an item of property that has an acquisition cost of \$5,000 or more and an expected service life of more than one year. (Note that this designation applies for proposal budgeting only and differs from the DOE definition of capital equipment.) List each item of equipment separately and justify each in the budget justification section. Allowable items ordinarily will be limited to research equipment and apparatus not already available for the conduct of the work. General-purpose office equipment, such as a personal computer, is not eligible for support unless primarily or exclusively used in the actual conduct of scientific research.

Section D. Travel

In the budget justification, list each trip's destination, dates, estimated costs including transportation and subsistence, number of staff traveling, the purpose of the travel, and how it relates to the project. Indicate whether travel cost estimates are based upon quotes from travel agencies; upon past experience of similar number of trips to similar travel destinations; or something else (describe). To qualify for support, attendance at meetings or conferences must enhance the investigator's capability to perform the research, plan extensions of it, or disseminate its results.

Applicants should include funding to participate in a kick-off meeting and annual Principal Investigators (PI) meetings, in addition to project team meetings necessary to support any collaborations. Award recipients may also be invited to Extreme Scale Research PI meetings, which are expected to occur annually.

International travel is encouraged to help researchers maintain awareness of relevant developments in other countries.

Section E. Participant/Trainee Support Costs:

If applicable, submit training support costs. Educational projects that intend to support trainees (precollege, college, graduate and post graduate) must list each trainee cost that includes stipend levels and amounts, cost of tuition for each trainee, cost of any travel (provide the same information as needed under the regular travel category), and costs for any related training expenses. Participant costs are those costs associated with conferences, workshops, symposia or institutes and breakout items should indicate the number of participants, cost for each participant, purpose of the conference, dates and places of meetings and any related administrative expenses. In the budget justification, indicate whether trainee cost estimates are based upon past experience of support of similar number of trainees on similar projects; past experience of support of similar number of participants attending similar conferences/workshops/symposia; or something else (describe).

Section F. Other Direct Costs:

Enter Other Direct Costs information for each item listed.

- **Materials and Supplies:** Enter total funds requested for materials and supplies in the appropriate fields. In the budget justification, indicate general categories such as glassware, and chemicals, including an amount for each category (items not identified under “Equipment”). Categories less than \$1,000 are not required to be itemized. In the budget justification, indicate whether cost estimates are based upon past experience of purchase of similar or like items; quotes/catalog prices of similar or like items; or something else (describe).
- **Publication Costs:** Enter the total publication funds requested. The proposal budget may request funds for the costs of documenting, preparing, publishing or otherwise making available to others the findings and products of the work conducted under the award. In the budget justification, include supporting information. In the budget justification, indicate whether cost estimates are based upon past experience of purchase of similar or like items; vendor quotes of similar publication services; or something else (describe).
- **Consultant Services:** Enter total funds requested for all consultant services. In the budget justification, identify each consultant, the services he/she will perform, total number of days, travel costs, and total estimated costs. In the budget justification, indicate whether consultant cost estimate is based upon previous experience/quotes for similar or like services; or something else (describe).
- **ADP/Computer Services:** Enter total funds requested for ADP/Computer Services. The cost of computer services, including computer-based retrieval of scientific, technical and education information may be requested. In the budget justification, include the established computer service rates at the proposing organization if applicable. In the budget justification, indicate whether cost estimates are based upon quotes/past experience of purchase of similar computer services; established computer service rates at the proposing institution; or something else (describe).
- **Subawards/Consortium/Contractual Costs:** Enter total costs for all subawards/consortium organizations and other contractual costs proposed for the project. In the budget justification, justify the details.
- **Equipment or Facility Rental/User Fees:** Enter total funds requested for Equipment or Facility Rental/User Fees. In the budget justification, identify each rental/user fee and justify. In the budget justification, indicate whether cost estimates are based upon past experience with similar or like items; vendor quotes of similar items; or something else (describe).
- **Alterations and Renovations:** Not allowable costs for this Announcement.
- **In the budget justification,** itemize by category and justify the costs of alterations and renovations, including repairs, painting, removal or installation of partitions, shielding, or air conditioning. Where applicable, provide the square footage and costs.
- **Other:** Add text to describe any other Direct Costs not requested above. Enter costs associated with “Other” item(s). Use the budget justification to further itemize and justify.

Section G. Direct Costs

This represents Total Direct Costs (Sections A thru F) and will be calculated by PAMS.

Section H. Other Indirect Costs

Enter the Indirect Cost information for each field. Only four general categories of indirect costs are allowed/requested on this form, so please consolidate if needed.

Section I. Total Direct and Indirect Costs

This amount will be calculated by PAMS (Sections G + H)

D. SUBMISSIONS FROM SUCCESSFUL APPLICANTS

If selected for award, DOE reserves the right to request additional or clarifying information.

E. SUBMISSION DATES AND TIMES**1. Letter of Intent Due Date**

N/A

2. Preproposal Due Date

June 11, 2015, by 5 PM Eastern Time.

ENCOURAGE/DISCOURAGE DATE

June 16, 2015 at 5 PM Eastern Time

You are encouraged to submit your preproposal well before the deadline.

3. Proposal Due Date

July 13, 2015, by 5 PM Eastern Time.

You are encouraged to transmit your proposal well before the deadline.

4. Late Submissions

Delays in submitting letters of intent, preproposals, and proposals may be unavoidable. DOE has accepted late submissions when applicants have been unable to make timely submissions because of widespread technological disruptions or significant natural disasters. DOE has made accommodations for incapacitating or life-threatening illnesses and for deaths of immediate family members. Other circumstances may or may not justify late submissions. Unacceptable justifications include the following:

- Failure to begin submission process early enough.
- Failure to provide sufficient time to complete the process.
- Failure to understand the submission process.
- Failure to understand the deadlines for submissions.
- Failure to satisfy prerequisite registrations.
- Unavailability of administrative personnel.
- An upper respiratory infection (a “cold”) the week of the deadline.

You are responsible for beginning the submission process in sufficient time to accommodate reasonably foreseeable incidents, contingencies, and disruptions.

Applicants must contact the Program Office/Manager listed in this Announcement to discuss the option of a late submission. Contacting the Program Office/Manager after the deadline may reduce the likelihood that a request will be granted.

DOE notes that not all requests for late submission will be approved.

You may be able to submit your proposal in response to the currently available Office of Science Annual Solicitation. Please contact the Program Office/Manager listed in this Announcement to discuss this option.

F. FUNDING RESTRICTIONS

Funding for all awards and future budget periods are contingent upon the availability of funds appropriated by Congress and the availability of future-year budget authority.

G. OTHER SUBMISSION AND REGISTRATION REQUIREMENTS

1. Where to Submit

Proposals must be submitted through PAMS to be considered for award.

Please only submit a PAMS lab technical proposal in response to this Announcement; do not submit a DOE Field Work Proposal (FWP) at this time. The Office of Science will request FWPs via the Searchable FWP system later from those selected for funding consideration under this Announcement.

2. Registration Process

ONE-TIME REGISTRATION PROCESS

You must complete the one-time registration process (all steps) before you can submit your first proposal through PAMS. Registration instructions appear in the front matter of this Announcement.

For help with PAMS, click the “External User Guide” link on the PAMS website, <https://pamspublic.science.energy.gov/>. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, Email: sc.pams-helpdesk@science.doe.gov. All submission and inquiries about this DOE National Laboratory Program Announcement should reference **LAB 15-1338**.

3. Proposal Receipt Notices

Upon submission, the PI will receive an email from the PAMS system <PAMS.Autoreply@science.doe.gov> acknowledging receipt of the proposal.

4. Viewing Submitted Proposals

Upon submission, the proposal will appear under My Proposals for the PI and the Submitter with a Proposal Status of “Submitted to DOE.”

Section V - PROPOSAL REVIEW INFORMATION

A. CRITERIA

1. Initial Review Criteria

Prior to a comprehensive merit evaluation, DOE will perform an initial review to determine that (1) the applicant is eligible for the award; (2) the information required by the Program Announcement has been submitted; (3) all mandatory requirements are satisfied; (4) the proposed project is responsive to the objectives of the Program Announcement, and (5) the proposed project is not duplicative of programmatic work. Proposals 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

Proposals will be subjected to scientific merit review (peer review) and will be evaluated against the following criteria, listed in descending order of importance.

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 also include program policy factors such as the relevance of the proposed research to the terms of the DOE National Laboratory Announcement and the agency's programmatic needs, the balance of activities within the program, and the utility of the proposed activities to the broader scientific community. 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 proposal constitutes agreement that this is acceptable to the investigator(s) and the submitting institution.

The questions below are provided to the merit reviewers to elaborate the criteria:

1. SCIENTIFIC AND/OR TECHNICAL MERIT OF THE PROPOSED RESEARCH

- What is the scientific innovation of proposed effort?
- How does the proposed work compare with other efforts in its field, both in terms of scientific and/or technical merit and originality?
- How might the results of the proposed work impact the direction, progress, and thinking in relevant scientific fields of research?
- What is the likelihood of achieving influential results?
- Is the Data Management Plan suitable for the proposed research and to what extent does it support the validation of research results?
- What is the scientific innovation of proposed research? What is the likelihood of achieving valuable results? How might the results of the proposed research impact the direction, progress, and thinking in relevant scientific fields of research? How does the proposed research compare with other research in its field, both in terms of scientific and/or technical merit and originality?

1.1 Briefly summarize the proposal technical content in your own words.

1.2 What are the strengths and weaknesses of the proposed research with respect to the theme in the call for proposals that is addressed in the proposal?

1.3 Evaluate the overall responsiveness of the proposed research to the call for proposals and the potential of the proposed research have a significant positive impact in that area.

1.4 Does the application advance DOE's mission of supporting open-source software as described in the policy applicable to DOE National Laboratories at:
http://science.energy.gov/~media/ascr/pdf/research/docs/Doe_lab_developed_software_policy.pdf

2. APPROPRIATENESS OF THE PROPOSED METHOD OR APPROACH

- Does the proposed effort employ innovative concepts or methods?
- How logical and feasible are the approaches?
- Are the conceptual framework, methods, and analyses well justified, adequately developed, and likely to lead to scientifically valid conclusions?
- Does the applicant recognize significant potential problems and consider alternative strategies?

2.1 Does the proposal reflect sufficient understanding of the challenges presented by the expected exascale architecture and software environment for the research to be successful?

2.2 Evaluate the plan for conducting the research. Is there a clear and coherent plan for the proposed research so that it is an integrated endeavor? Especially for collaborative proposals, is there strong enough leadership, communication and coordination? Does the proposal include a clear plan for deliverables, a reasonable timeline, and sound methods for assessing the effectiveness of the research?

3. COMPETENCY OF APPLICANT'S PERSONNEL AND ADEQUACY OF PROPOSED RESOURCES

- Does the proposed work take advantage of unique facilities and capabilities?
- What is the past performance of the team?
- How well qualified is the team to carry out the proposed work?
- Are the environment and facilities adequate for performing the proposed effort?

4. REASONABLENESS AND APPROPRIATENESS OF THE PROPOSED BUDGET

- Are the proposed budget and staffing levels adequate to carry out the proposed work?
- Is the budget reasonable and appropriate for the scope?

4.1 Are the levels of support and commitment requested by the PI and other senior personnel appropriate and necessary to meet the research objectives? Does the PI commit at least 20% of his/her time to the project? Does the budget include any senior personnel who are committed at too low a level to have a positive impact on the project?

4.2 Is the proposed budget for travel reasonable and appropriate for the number of people supported and the level of coordination that is necessary for the project to succeed?

B. REVIEW AND SELECTION PROCESS

1. Merit Review

Proposals that pass the initial review will be subjected to a formal merit review and will be evaluated based on the criteria above.

2. Selection

The Selection Officials will consider the following items, listed in no order of significance:

- Scientific and technical merit of the proposed activity as determined by merit review
- Availability of funds
- Relevance of the proposed activity to Office of Science priorities and those of ASCR
- Ensuring an appropriate balance of activities within Office of Science programs and across the ASCR portfolio
- Previous performance
- Relevance to the mission of and systems operated by the Advanced Scientific Computing Research program

3. Discussions and Award

The Government may enter into discussions with a selected applicant for any reason deemed necessary. Failure to resolve satisfactorily the issues identified by the Government will preclude award to the applicant.

C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES

It is anticipated that the award selection will be completed by September 1, 2015. It is expected that DOE National Laboratory awards will be made in Fiscal Year 2015. Non-Laboratory awards for applications submitted in response to the companion FOA DE-FOA-0001338 will be made during Fiscal Year 2016, with an expected start date of February 15, 2016. DOE is interested in seeing projects supported under this Announcement begin work by September 30, 2015. Actual start dates will be determined during the negotiation process for selected projects.

Section 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.

Non-selected Notification: Organizations whose proposals have not been selected will be advised as promptly as possible. This notice will explain why the proposal was not selected.

2. Notice of Award

A work authorization/contract modification issued by the contracting officer is the authorizing award document.

B. REPORTING

Annual progress reports from the award investigator will be required and will be due 90 days before the end of each budget year.

Section VII - QUESTIONS/AGENCY CONTACTS

A. QUESTIONS

For help with PAMS, click the “External User Guide” link on the PAMS website, <https://pamspublic.science.energy.gov/>. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, Email: sc.pams-helpdesk@science.doe.gov. All submission and inquiries about this DOE National Laboratory Program Announcement should reference **LAB 15-1338**.

Please contact the PAMS help desk for technological issues with the PAMS system.

Questions regarding the specific program areas and technical requirements may be directed to the technical contacts listed for each program within the DOE National Laboratory Program Announcement or below.

Please contact the program staff with all questions not directly related to the PAMS system.

B. AGENCY CONTACTS

PAMS Customer Support	855-818-1846 (toll-free) 301-903-9610 sc.pams-helpdesk@science.doe.gov
Program Manager Scientific Contact	Dr. Lucy Nowell 301-903-3191 Lucy.Nowell@science.doe.gov

Section VIII - OTHER INFORMATION

A. MODIFICATIONS

Notices of any modifications to this DOE National Laboratory Announcement will be posted on the Grants and Contracts website (<http://science.energy.gov/grants/>).

B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE

DOE reserves the right, without qualification, to reject any or all proposals received in response to this DOE National Laboratory Announcement and to select any proposal, 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 PROPOSAL INFORMATION

Patentable ideas, trade secrets, proprietary or confidential commercial or financial information, disclosure of which may harm the applicant, should be included in a proposal 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 proposal which are to be restricted:

“The data contained in pages _____ of this proposal have been submitted in confidence and contain trade secrets or proprietary information, and such data shall be used or disclosed only for evaluation purposes.”

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

F. 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.