PROGRAM ANNOUNCEMENT
TO DOE NATIONAL LABORATORIES

U. S. Department of Energy
Office of Science

Office of Biological and Environmental Research (BER) and Office of Advanced Scientific Computing Research (ASCR)

Scientific Discovery through Advanced Computing: Scientific Computation Application Partnerships in Earth System Science II – Pilot Projects

DOE National Laboratory Announcement Number: LAB 17-1682
Announcement Type: Amendment 000001

Issue Date: **11/09/2016**

Pre-Proposal Due Date: **01/17/2017 at 5 PM Eastern Time**

                                                        A Pre-Proposal is required

Encourage/Discourage Date: **01/20/2017 at 5 PM Eastern Time**

Proposal Due Date: **03/15/2017 at 5 PM Eastern Time**

Amended 11/29/2016 to correct the Summary Statement on page 1.

Table of Contents

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 pre-proposals, letters of intent, and proposals directly into PAMS.

You must register in PAMS to submit a pre-proposal, 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 17-1682.**

RECOMMENDATION

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

Section I – DOE NATIONAL LABORATORY OPPORTUNITY DESCRIPTION

GENERAL INQUIRIES ABOUT THIS ANNOUNCEMENT SHOULD BE DIRECTED TO:

Technical/Scientific Program Contacts:
    Dr. Dorothy Koch (BER)
    301-903-0105
    Dorothy.Koch@science.doe.gov

    Dr. Randall Laviolette (ASCR)
    301-903-5195
    Randall.Laviolette@science.doe.gov

SUMMARY

This Biological and Environmental Research (BER)-Advanced Scientific Computing Research (ASCR) Scientific Development Thru Advanced Computing (SciDAC) Partnership FOA will enable scientists to conduct complex scientific and engineering computations at a level of fidelity needed to simulate real-world climate conditions, by supporting deep, necessary, and productive collaborations between climate scientists on the one hand and applied mathematicians and computer scientists on the other, that overcome the barriers between these disciplines and consequently fully exploit the capabilities of Department of Energy (DOE) High Performance Computing (HPC) systems in order to accelerate advances in climate science. This SciDAC opportunity invites creative and innovative pilot approaches to climate model component design that are mindful of leading edge computer architectures. The next-generation climate model capabilities will contribute to the newly launched Accelerated Climate Model for Energy (ACME) and further its progress toward design of climate codes for leadership class computers and in support of energy science and mission requirements.

SUPPLEMENTARY INFORMATION

The SciDAC program. The SciDAC program was initiated in 2001, re-competed in 2006, and most recently re-competed in 2011-2012. SciDAC involves partnerships between ASCR and each of the other Office of Science (SC) Programs, in order to dramatically accelerate progress in scientific computing. Through partnerships between domain disciplines, such as climate, with ASCR-funded mathematicians and computer scientists, SciDAC projects develop computational solutions to challenging problems in disciplines such as chemistry, climate science, fusion research, high energy physics, nuclear physics, and materials science. Today the SciDAC program is recognized as the leader in accelerating the employment of high-performance computing to advance the state of knowledge in science applications. These advances in

applications would not have been possible without the expertise in applied mathematics and computer science developed and provided in collaborations with scientists.

This solicitation is part of the 2017 re-competition of the SciDAC Partnerships, which consist of jointly funded and managed collaborations between climate scientists (sponsored by BER) and applied mathematicians or computer scientists (sponsored by ASCR). These partnerships will enable deep, necessary, and productive collaborations between climate researchers on the one hand and applied mathematicians and computer scientists on the other, that overcome the barriers between these disciplines and consequently fully exploit the capabilities of DOE HPC systems in order to accelerate advances in science. In this way, Partnerships enable scientists to conduct complex scientific and engineering computations at a level of fidelity needed to simulate real-world conditions. Please see
http://science.energy.gov/~/media/ascr/pdf/facilities/ASCR_Computiing_Facility_Upgrades.pdf
for a one-page summary of available or planned (for this period of the Partnerships) ASCR HPC systems.

Biological and Environmental Research (BER): Biological and Environmental Research (BER) supports fundamental, interdisciplinary research to achieve a predictive systems-level understanding of climate and Earth system changes and systems biology, which requires the organization and integration of diverse interdisciplinary data and models in innovative ways. In particular, BER seeks to develop advanced mathematical methods and computational models for systems ranging from molecular to global scales and an ability to connect large and diverse datasets with models, which enables more holistic and robust predictions of complex system behavior.

This Partnership is supported through BER's Earth System Modeling (ESM) activity. ESM more broadly supports the development, coupling and testing of global climate modeling systems in support of DOE climate science and mission. Model developments include atmospheric dynamics, clouds and chemistry; ocean dynamics and biogeochemistry; sea-ice and dynamic land-ice systems; land hydrology and biogeochemistry; and representations of human activities that have important interactions with climate. ESM also supports the application of advanced algorithmic and computing methods to optimize the climate model performance on DOE HPC systems. The newest climate components are based on variable (atmosphere) as well as irregular (ocean, ice and land) grids. Sophisticated frameworks to test, analyze, calibrate, visualize and validate model results are under development, in order to calibrate the model against measurements. A critical scientific challenge is to maximize model computational performance, by identifying the optimal combination of model resolution and process representation that provides information on climate trends, variabilities, extremes, and tipping points, of most interest to the DOE science and mission.

Topics demanding more research involving applied mathematics, computer science and software advances for climate modeling therefore include: coupling methods, time-stepping, and load-balancing for multi-physics and multi-scale (in space and time) systems; methods to accelerate system spin-up, equilibration, and solution convergence of Earth systems; algorithms for physics, biogeochemistry and hydrology for high or variable resolution; mathematical methods to determine system predictability; methods to derive statistics and diagnostics during simulation;

algorithm design that map to new architectures and memory structures; and optimization of model performance and portability. The ultimate goal of the ESM program, and its new ACME system, is to understand the interdependencies of climate components, so that simulations of regional and global climate change exhibit a high degree of confidence and certainty, over decadal to centennial time scales.

The Accelerated Climate Modeling for Energy (ACME) project was initiated in 2014 and is expected to release its first major model version (version 1 or v1) in late CY2017. ACME is developing and applying a computationally advanced climate and Earth system model to investigate the challenges posed by the interactions of climate change with energy and related sectors. The ACME model simulates the fully coupled climate system at high-resolution (15-25km), with a focus on near-term hindcasts (1970-2015) for model validation and near-term projection (2015-2050) important for energy-resource planning. The model further employs regional-refinement using advanced adaptive mesh methodologies in order to provide ultra-high-resolution to resolve critical physical and dynamical phenomena. The ACME model branched from the Community Earth System Model (CESM) in 2014, and strives to further design the code to optimize performance on current and future DOE HPC systems.

ACME's scientific goals address three areas of importance to both climate research and society:
1. **Water cycle**. The key water cycle question is: "How do the hydrological cycle and water resources interact with the climate system on local to global scales?" The initial phase of the project focuses on precipitation and surface water in orographically complex regions, including the western United States and Southeastern Asia. The longer-term goal is to understand how the hydrological cycle will evolve with climate change and the expected effect on local, regional, and national supplies of fresh water.
2. **Biogeochemistry**. The key biogeochemistry question is: "How do biogeochemical cycles interact with global climate change?" The degree of carbon exchange among components is critical for investigating human influences on atmospheric carbon and its climate effects. The initial phase of ACME is examining how more complete treatments of nutrient cycles affect carbon–climate system feedbacks.
3. **Cryosphere-ocean system**. The key cryosphere-ocean question is: "How do changes in cryosphere-ocean systems interact with the climate system?" As ACME builds and couples new dynamic ice sheet and ocean components, it simulates the potential for ice sheet melt, destabilization and sea-level rise, with particular focus on Antarctica. The Model Prediction Across Scales project, or MPAS-Ocean, provides a new capability to resolve eddies and to better represent the circumpolar deep water and dynamics associated with bringing this water onto the continental shelf under the ice sheet, with ocean model resolution attaining 5 km or less near the ice sheets, and the ice sheet resolution up to 500 m near the margins. Sea ice modeling is also crucial to capture the processes of buttressing at the ice shelf-sea ice boundary, as well as for projecting sea-ice changes in both hemispheres.

Computational and technical elements play a central role to the ACME project. During its initial phase, ACME has had substantial efforts in computational performance, software engineering, and workflow/diagnostics. Nevertheless, the technical challenges compound as the model system and the computer architectures become more complex, and as high and variable resolution methods are exercised. Therefore, these SciDAC Partnership projects are expected to contribute to advancing these technical efforts toward the next generation of codes and architectures.

3

Computational performance is essential for ACME in order to achieve its goals of investigating critical climate research topics as outlined above, at high resolution, and on DOE's powerful but complex and diverse architectures. During its start-up phase, ACME has been implementing conventional approaches, such as threading and message-passing while increasingly employing the use of on-processor accelerators added in the latest machine designs. Initial efforts in redesigning code for better concurrency through the use of modularized kernels for accelerators have been useful for adapting to the newest architectures. These SciDAC projects are expected to make important contributions to, among other things, improving the coupled model throughput, developing new methods to rapidly initialize components and the coupled-system, improving efficiency in capturing climate statistical information during simulation, exploring dynamic auto-tuning and load balancing to minimize latency, and improving code portability along with performance.

An important aspect of adaptation to new architectures is the effort to improve software design and practice. Initial phase ACME software engineering tasks have included maintaining build, test, and performance tools for the relevant computer platforms, and providing rapid development and debugging capabilities to the team. The ACME code repository expedites the merging and testing of the fully coupled system while also supporting a distributed development environment where separate features are being co-developed at different sites. More advanced goals include expanding the use of regression testing, tools for code coverage, correctness analysis, debugging at scale, and traceability of code back to scientific requirements. Productivity will be enhanced by greater use of libraries, frameworks, and tools. Some of these efforts are also supported under the new "CMDV-SM" project. In spite of current efforts, the ACME code is complex and extensive (over 1M lines of code) and there is ongoing need for improving and advancing code. SciDAC projects must help toward the ongoing modernization of ACME software practice.

ACME also has a substantial workflow effort, to enable and automate model simulation, post-processing, analysis and validation. Building from the Ultrascale Visualization Climate Data Analysis Tools (UV-CDAT) software, ACME component and coupled simulation output will ultimately be processed on a single workflow platform. The workflow software is tasked to accommodate the very large data sets from the ACME high-resolution simulations and to enable "server-side" analysis of output rather than requiring porting of output to local machines. The analysis provenance will be captured, to enable replication of the process. Model output will be hosted and shared through the Earth System Grid Federation, using a Climate Model Intercomparison (CMIP5) -friendly format. Model evaluation is initially based on well-established metrics developed by leading climate modeling centers. Availability of new observations, a focus on the ACME driving questions, and emphasis on high-resolution require development of new diagnostics and metrics. Metrics are being established that will track model improvement and realism of the coupled system. While these challenging tasks are part of the ACME working plan, there is opportunity for SciDAC projects to develop and incorporate improvements into the ACME workflow.

For more details on ACME, see the ACME project web page, and particularly Information for collaborators.

Current BER SciDAC-3 Partnership portfolio can be found at:
http://www.scidac.gov/bioenv/bioenv.html

DOE climate modeling programs and projects are further described here.

ASCR:
The challenge of the effective employment of DOE HPC for science is one that confronts applied mathematicians and computer scientists as well as domain scientists (*e.g.,* physicists, chemists, *etc*.), and has remained qualitatively much as Householder observed more than sixty years ago, that even a simple computation to be accomplished by a computing machine requires a profound understanding of both the mathematics of the problem and the potential sources of error.[1] Consequently we expect that the kind of collaborations required by this solicitation should result in advances that would not have been accomplished by those same researchers working separately.

SciDAC Partnerships enable scientists to conduct complex scientific and engineering computations at a level of fidelity needed to simulate real-world conditions. SciDAC enables deep, necessary, and productive collaborations between climate scientists on the one hand and applied mathematicians and computer scientists on the other, that overcome the barriers between these disciplines and consequently fully exploit the capabilities of DOE HPC systems in order to accelerate advances in science.We expect that these applied mathematicians or computer scientists, whose proposed contributions will be reviewed by their peers, would be those who have accomplished significant research in scientific computing on the most advanced high performance supercomputing systems. A record of funding from ASCR for such research, while not a prerequisite, may be regarded as evidence of relevant experience. Although it will not be required for this re-competition of SciDAC, it may be helpful to the proposers, as they build collaborations with applied mathematicians or computer scientists, especially those who are new to SciDAC, to consider the participants from previous instantiations of SciDAC listed at http://www.scidac.gov/institutes.html.

Some of the research conducted and expertise contributed by applied mathematicians would likely include, for example: Discretization methods for structured and unstructured grids; multi-physics coupling techniques; direct, iterative, and multi-level solvers for linear & nonlinear systems; time integrators; solution convergence; resilient algorithms, adaptive error estimation and Uncertainty Quantification (UQ), or UQ-aware methods; scalability to million-way+ parallelism; algorithm and code interoperability. Computer scientists might be expected to conduct research and contribute to: Application performance modeling and benchmarking, tuning and analysis, code profiling and optimization; fault tolerance and resilience; management, analytics and visualization of massive and heterogeneous scientific data sets; usability and user experience; runtime systems, portable programming, advanced debugging capabilities and

---

[1] A.S. Householder (1953)*, Principles of Numerical Analysis,* McGraw-Hill, New York. *p. vii.*

5

computational methods for hybrid, many and multi-core architectures; efficient use of new and emerging memory systems; workflow management, rapid prototyping, parallel I/O tools, and storage systems.

We would further expect that the research and contributions to the collaboration by applied mathematicians and computers scientists would be architecture aware, i.e., the main architectural features of existing and planned computing environments include: heterogeneous nodes (e.g., CPUs + GPUs); deep memory hierarchies; and varying trade-off costs for computation versus data movement. Therefore, tools and methodologies for coping with and taking full advantage of such architectural complexities are an important practical consideration as well as coordination of the proposed capabilities with past work across disciplines. Furthermore, the applied mathematicians and computer scientists should be aware of and have plans to incorporate the software engineering best practices that can contribute to the productivity of software developers and the long-term maintainability of the software as the computational systems and science evolve over time. An important contributor to software productivity is code portability across the DOE HPC systems. It is important that best practices are tailored to fit within the constraints of the scientific problem of the proposal and that close interactions are formed between software engineering experts, scientific software developers and scientists.

Topics

Proposals to this BER SciDAC partnerships are for 30-month pilot projects:

> Pilot projects are invited to develop "next-plus-2" components or major capabilities for ACME (i.e. v4). The proposal should make the case that these major developments are expected to lead to significantly improvements in: fidelity, coupled-system climate-predictability and computational performance. High-risk, high-pay-off approaches are encouraged. New algorithms and code-structures should be explored that would take advantage of the newest available architectures and include forward-looking designs to the extent possible.

> Desirable features within the projects could include: efforts to improve and accelerate the system equilibration; methods to test and improve solution convergence.

> The pilot (phase-1) proposals should describe 30 month proof-of-concept projects, and should include a vision section that describes what "phase-2", a second 30 months of funding, would achieve. The initial phase proposal should describe clear outcomes that would justify the pursuit of phase 2. During year 3 of these phase-1 projects, project progress and phase-2 proposals will be reviewed, with the potential for a subset of the phase-1 projects to continue, with increased support level.

ADDITIONAL REQUIREMENTS:

– Projects may be either DOE-Lab led or University-led. University collaborators should be supported through sub-contracts from the lead institution.

- Individuals may be PI on only one BER-ASCR-SciDAC proposal (including Lab 17-1681 and Lab 17-1682), hold major task leadership roles (see management requirements below) on no more than 2 proposals, and be listed as a co-investigator on no more than 3.
- For all DOE-Lab personnel, 0.33 FTE commitment is required per project, unless a compelling case is made for smaller commitment.
- Past performance for SciDAC and other major DOE-funded projects should be described in an appendix.
- Projects must involve multiple institutions.
- **Computing Resources:** Proposals will not request computing resources; instead, the allocation of computing resources available to individual projects is contingent on review and award through the processes as described at http://science.energy.gov/ascr/facilities/allocation-policy/. Within the available computational resources, every effort will be made to ensure that successful applications will have the resources needed to support their efforts.
- Projects should budget for key personnel to attend the annual SciDAC meeting and at least one of the two annual ACME project meetings.

Verification and Validation (V&V): A strong V&V component is essential for this effort and therefore applicants should discuss their V&V plans in sufficient detail.

Management Plan and Timeline of Activities: A management section should describe the management structure, how effective collaborations among the participants will be fostered, how integration of computational and science efforts will be attained, and the timeline for all major activities including performance metrics and deliverables. Proposers must include summary level budget tables by Performer and Task, respectively, as follows:

Budget by Institution

Institution	PI	Role	Y1 Budget	Y2 Budget	Y3 Budget	Total
		Lead PI				
		...				
Total						

Budget by Task

Task	Task Leader	Y1 Budget	Y2 Budget	Y3 Budget	Total
Task 1					
...					
Task n					
Total					

The proposers must identify a management structure that enables an effective collaboration among the participants. The structure and management must be sufficiently flexible to adapt quickly to changing technical challenges and scientific needs.

To that end, the proposal may identify two co-leaders (respectively leading climate and computational elements of the project) from among the principal investigators, at least one of whom is employed by the Lead institution (n.b., <u>even with co-led projects there can still only be one Lead institution</u>), who would share the duties and responsibilities that would include leading the project and serving as the primary contacts responsible for communications with the DOE program managers on behalf of all the principal investigators. Furthermore, the proposal should specify the requested level of support for each task.

The management plan must specify a Task list with Task leads and timeline that will allow progress and contributions to be measured over the course of the research. For example, these could take the form of milestones for progress in the various components of the research. The project as a whole will provide an annual report to the PMs.

Annual Reporting Requirement for the Project

1. Progress report on the project's accomplishments annually; PIs should be concise and limit the progress report to **20** pages (excluding Appendices.)
2. Annual report guidelines: Organize the annual report around a main section, plus appendices. The main section of the progress report should start with a brief summary of the project's title, abstract, objectives, desired outcomes and deliverables, management plan, personnel, data plan (if relevant), and web presence. This should be followed by reporting the project's progress, in direct reference to each of the project objectives. For each of the objectives, please provide a summary of progress in achieving desired outcomes:

  a. Summary of major scientific results, e.g., as short science abstracts from journal articles, posters, and major presentations

  b. Summary of other major activities, e.g., workshops, that facilitate the scientific research

  c. Reporting on any difficulties or changes in direction, scope

  d. Summary of project management such as project structure and meeting frequency

  e. Summary of new capabilities and issues

3. Following the summaries in reference to the set of project objectives, please provide updated plans for the coming years

4. In the Appendices, please provide:

  a. Appendix 1: A list of publications and presentations (limit to those primarily supported by this project), and if relevant also capabilities such as new software and data analytics developments

  b. Appendix 2: Provide the science highlights transmitted to BER or ASCR during the past year

  c. Appendix 3: An updated list of personnel (a complete list with role, institution, and FTE)

The project management plan must also include a timeline and a structure for relating to the ACME project. A timeline of when and how new developments would be included into the main ACME code should be provided, with the understanding that these will need to be updated as the respective projects evolve.

Guidelines for engagement with the ACME project

This Lab Announcement provides an opportunity for collaborations to be established with the ACME project. If a project receives an award, the project will need to draft an agreement that articulates details of the collaboration, including plans for development, simulation, code release and publication expectations; these "collaboration agreements" are meant to establish transparency and clarity among developers, and may be negotiated and adjusted to maximize overall project productivity (see the standard ACME Collaboration Policy.)

In order to facilitate coordination with ACME, proposals must address each of the following:

1. Proposals must make the case for how they will enhance ACME's overarching goals and how they will complement or extend the expected v3 (or later) developments.

2. Proposals should demonstrate a plan to adhere to (at minimum) or improve upon the ACME software development processes in order to see their developments fully integrated into ACME. For more information, see this high-level perspective of ACME software practice.

3. Key project personnel should plan to attend one or both ACME face-to-face Team meetings; they are also encouraged to participate in ACME task telephone calls, as appropriate to the mutual goals of the teams.

4. As required by DOE's Office of Science, a "data management plan" (DMP) must be included in each application. This plan should be compatible with the ACME DMP.

Teaming Arrangements:

Collaboration

Collaborative proposals submitted from different institutions must clearly indicate they are part of a collaborative project/group. Every partner institution 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.

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.

Collaborative proposals from institutions other than DOE National Laboratories should be submitted following the above rules in response to the companion announcement, DE-FOA-0001682. 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.

<center>**Section II – AWARD INFORMATION**</center>

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 FOA.

B. ESTIMATED FUNDING

It is anticipated that a total of $15,800,000 will be provided and approximately $6,333,000 per year will be available under this DOE National Laboratory Announcement and the companion FOA DE-FOA-0001682, contingent on satisfactory peer review and the availability of appropriated funds. Applicants should request project support for 30 months. Following the first year award, out-year support will be contingent on the availability of appropriated funds, progress of the research, and programmatic needs. Awards are expected to begin in fiscal year 2017.

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

The award size will depend on the availability of appropriated funds.

Ceiling
$1,500,000 per collaboration per year

Floor
$500,000 per collaboration per year

D. EXPECTED NUMBER OF AWARDS

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

E. ANTICIPATED AWARD SIZE

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

F. PERIOD OF PERFORMANCE

Research Awards are expected to be made for a period of 30 months.

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; (4) compliance with the terms and conditions of the award; and (5) meritorious performance on mid-term project review.

G. TYPE OF PROPOSAL

DOE will accept new 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.

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 PRE-PROPOSAL

1. Letter of Intent

A Letter of Intent is not required.

2. Pre-proposal

PRE-PROPOSAL DUE DATE
January 17, 2017, 5:00 pm ET

ENCOURAGE/DISCOURAGE DATE
January 20, 2017, 5:00 pm ET

A pre-proposal is required and must/should be submitted by January 17, 2017, by 5:00 pm ET.

Pre-proposals 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 January 20, 2017. 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 pre-proposal 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: LAB17-1682
Project keywords (up to 5)

Name	Institution	Anticipated Budget BER	Anticipated Budget ASCR
PI			
Co-PI			
Co-PI			
Total budget			

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 point and margins no smaller than one inch on all sides. Figures and references, if included, must fit within the two-page limit. **Proposers should include sufficient information in their pre-application to evaluate responsiveness to the terms of this announcement.** At a minimum, this must include: articulation of Computational-Climate partnership elements, particular developments to be proposed, project scientific objectives, how the project would complement or extend the current ACME developments and goals, how the project would enhance coupled-climate predictability and computational performance, how proposed algorithms or code structures would take advantage of newest architectures, and an argument for the significance of the development to global climate modeling.

The pre-proposal must also include a list of the names and institutional affiliations of all participating investigators, including collaborators and consultants on the proposed project. For each funded investigator, provide a list 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 publications or collaborations with more than 10 authors, only list those individuals in the core group with whom the Principal Investigator interacted on a regular basis while the research was being done.

Those pre-proposals 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 pre-proposal 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 pre-proposal 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 pre-proposal be a single file with extension .pdf, .docx, or .doc. The pre-proposal 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 pre-proposal. All PIs and those submitting pre-proposals 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 Pre-Proposal:
- Create your pre-proposal (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 **LAB 17-1682.**

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

March 15, 2017 at 5:00 PM Eastern Time

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 collaboration from unfunded collaborators should also be included, if applicable, and should be placed in an Appendix (Other Attachments) after the Data Management Plan. These letters should state the intention to participate in the proposed research, with a brief description of the activities to be undertaken by the collaborator. **Do not submit general letters of support** as these are not used in making funding decisions and can interfere with the selection of peer reviewers.

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:
    - o Proposal Cover Page
    - o Table of Contents
    - o Project Narrative (main technical portion of the proposal, including

18

background/introduction, proposed research and methods, timetable of activities, and responsibilities of key project personnel – 10 page limit)
- o Appendix 1: Biographical Sketch(es)
- o Appendix 2: Current and Pending Support
- o Appendix 3: Bibliography and References Cited
- o Appendix 4: Facilities and Other Resources
- o Appendix 5: Equipment
- o Appendix 6: Data Management Plan
- o 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 17-1682.** Full proposals submitted in response to this Program Announcement must be submitted to PAMS no later than **March 15, 2017**, 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 17-1682.**

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 name of the applicant, the Principal Investigator (PI), the project title, the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (i.e., benefits, outcomes). 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:
- DOE National Laboratory Announcement Number: **LAB 17-1682**

- DOE/Office of Science Program Office: Office of Biological and Environmental Research and Office of Advanced Scientific Computing Research
- DOE/Office of Science Program Office Technical Contact: Dr. Dorothy Koch (BER) and Dr. Randall Laviolette (ASCR)
- PAMS Letter of Intent Tracking Number:
- Research area (site) identified in Section I of this Announcement
- Project keywords (up to five)

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

Collaborative proposals submitted from different institutions must clearly indicate they are part of a collaborative project/group. Every partner institution 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.
- 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.

Example budget table ($ in thousands)

Partnership	Year 1	Year 2	Year 3	Total
Lead PI / Institution				
Institutional PI / Institution				
Institutional PI / Institution				
Total				

- Include a table modeled on the following chart providing summary budget information for all tasks.

Task	Task Leader	Y1 Budget	Y2 Budget	Y3 Budget	Total
Task 1					
...					
Task n					

* Note that collaborating proposals must be submitted separately.

PROJECT NARRATIVE (NO MORE THAN 20 PAGES LONG)

The project narrative **must not exceed 20 pages** of technical information, including charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right). 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.

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.

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. 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.

Progress from DOE-funded research:

As described under Merit Review, proposers will also be evaluated on past performance from previously funded related research, i.e., funded by SciDAC, ESM or ASCR. **Previously funded proposers will therefore be required to submit as an Appendix to the Project Narrative section a description of past (SciDAC, ESM or ASCR) research, results obtained, and notable accomplishments of the research**. Also relevant to this section are collaborative or programmatic contributions of benefit to these programs. The Appendix should be titled "Progress from DOE-funded research" and should be appended immediately to the end of the Project Narrative. This section should be no longer than 4 pages and will not count towards the 25 page limit of the Project Narrative. Applicants who have not received previous funding from one of these programs should include the section title followed by a statement that there is no applicable previous DOE-funded funded research.

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. 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. Examples of information of interest are invited and/or public lectures, awards received, scientific program committees, conference or workshop organization, professional society activities, special 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 chronological order, professional/academic positions with a brief description.

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

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

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

- **Collaborators and Co-editors**: List in alphabetical order all persons, including their current organizational affiliation, who are, or who have been, collaborators or co-authors with you on a research project, book or book article, report, abstract, or paper during the 48 months preceding the submission of this proposal. For publications or collaborations with more than 10 authors or participants, only list those individuals in the core group with whom the Principal Investigator interacted on a regular basis while the research was being done. Also, list any individuals who are currently, or have been, co-editors with you on a special issue of a journal, compendium, or conference proceedings during the 24 months preceding the submission of this proposal. 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.

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 a 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

27

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.

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 3 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.

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. Also include a written narrative in the budget justification that fully justifies the need for requested personnel.

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.

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.

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:** Enter total funds requested for Alterations and Renovations.
- **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

None

2. Pre-proposal Due Date

January 17, 2017, 5:00 pm ET

You are encouraged to submit your pre-proposal well before the deadline.

3. Proposal Due Date

March 15, 2017, 5:00 pm ET

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

4. Late Submissions

Proposals received after the deadline will not be reviewed or considered for award.

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 17-1682.**

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.

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.

- Scientific and/or Technical Merit of the Project;
- Appropriateness of the Proposed Method or Approach;
- Competency of Applicant's Personnel and Adequacy of Proposed Resources; and
- Reasonableness and Appropriateness of the Proposed Budget.
- Data Management Plan
- Effectiveness of the Management Plan

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 or Technical Merit of the Project**
   a. How would the proposed research lead to significant improvements in simulation capability? Is it likely that the proposed research will accelerate scientific discovery through computation on DOE HPC systems?
   b. What current bottlenecks or uncertainties in climate research are targeted by the proposed project? What science will become feasible with this collaboration that is not feasible now?
   c. Does the research plan contain appropriate project-performance metrics that will allow progress and contributions to be measured?
   d. Could the proposed work be characterized as "innovative", "high-risk, possibly high pay-off", or "influential"?

e. Does the proposed research employ or lead to state-of-the-art approaches that effectively employ DOE HPC systems? Can this project be completed on computing platforms that are currently available or are expected to be available by 2019?

f. 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?

g. Is a clear case made that the proposed developments will lead to improved model fidelity, coupled-system predictability and computational performance?

2. **Appropriateness of the Proposed Method or Approach**

a. Does the proposal describe model developments that will likely lead to improvements to the ACME climate capabilities or research and/or computational advances of the ACME model?

b. Are there significant potential problems in the proposed method or approach? If so, are the proposer's plans to address these problems—including the consideration of alternative strategies—adequate?

c. Does the proposed research include a plan to characterize model uncertainty and a plan for validation and verification?

d. Does the proposed research exploit existing resources or contribute new resources (e.g., algorithms, software) or would it result in a duplication of existing resources?

e. Does the project demonstrate a functional collaboration between the climate scientists and applied mathematicians or computer scientists? Is the proposed collaboration necessary to achieve results?

f. Does the proposed research plan recognize and attempt to address the mathematical, algorithmic, software, or architectural challenges arising in the relevant computations?

g. Are there clear indicators of phase-1 success and a compelling case for phase-2 objectives?

3. **Competency of Applicant's Personnel and Adequacy of Proposed Resources**

a. Does the proposer's team include required expertise and demonstrated capabilities in both the proposed climate science and applied mathematics or computer science research topics?

b. Is the proposed team of researchers likely to work together in a cohesive and integrated manner? Have they demonstrated their ability to do so in the past?

c. Have the proposers demonstrated significant contributions on previous DOE-funded research (if applicable)?

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

a. Does the budget include appropriate support for all sides and levels of the collaboration?

5. **Data Management Plan**
   a. Is the Data Management Plan suitable for the proposed research?

6. **Effectiveness of the Management Plan**
   a. Does the proposal describe a well-integrated team-based approach to addressing the scientific goals? Does the management plan credibly enable collaboration?
   b. Does the leadership appear to be qualified? Does the proposer have a proven record of success in managing diverse teams of scientific and technical experts and delivering results for advanced computational science research?
   c. Does the proposer present an organizational structure that delineates the roles and responsibilities of senior/key personnel?
   d. Has the proposal presented a clearly defined mechanism to evaluate success and failure and to reconfigure the project as needed? Does the management plan include a clear task plan and timeline?
   e. Does the management plan include plans for interaction and integration with the ACME project and are there satisfactory responses to the 4 Guidelines for engagement with ACME?

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
- Ensuring an appropriate balance of activities within Office of Science programs
- Previous performance

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 June 15, 2017. It is expected that awards will be made in Fiscal Year 2017.

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 17-1682.**
      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. Dorothy Koch, BER 301-903-0105 Dorothy.Koch@science.doe.gov Dr. Randall Laviolette, ASCR 301-903-5195 Randall.Laviolette@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.