

**DEPARTMENT OF ENERGY (DOE)
OFFICE OF SCIENCE (SC)
HIGH ENERGY PHYSICS (HEP) &
ADVANCED SCIENTIFIC COMPUTING RESEARCH (ASCR)**



**SCIENTIFIC DISCOVERY THROUGH ADVANCED COMPUTING:
HIGH ENERGY PHYSICS**

**DOE NATIONAL LABORATORY PROGRAM ANNOUNCEMENT NUMBER:
LAB 22-2580**

ANNOUNCEMENT TYPE: INITIAL

Announcement Issue Date:	November 3, 2021
Submission Deadline for Letter of Intent:	December 15, 2021, 5 pm ET A Letter of Intent is required
Submission Deadline for Proposals:	February 9, 2022 5 pm ET

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UPDATES AND REMINDERS

RECOMMENDATION

The Department of Energy (DOE) Office of Science (SC) encourages you to register in all systems as soon as possible. You are also encouraged to submit letters of intent and proposals before the deadline.

CURRENT AND PENDING SUPPORT AND BIOGRAPHICAL SKETCHES

The instructions for the content of current and pending support and biographical sketches have changed. Please read the instructions carefully and follow them.

INDIVIDUALS WHO SHOULD NOT SERVE AS MERIT REVIEWERS

Follow the updated instructions in [Section VIII](#) and consider the use of the template available at <https://science.osti.gov/grants/Policy-and-Guidance/Agreement-Forms>. Do not include this list as part of the biographical sketch.

DATA MANAGEMENT PLAN

The Office of Science Statement on Digital Data Management, published at <http://science.osti.gov/funding-opportunities/digital-data-management/>, governs proposals submitted under this Announcement. Compliance is detailed in Section IV of this Announcement.

ACKNOWLEDGMENT OF FEDERAL SUPPORT

SC guidance about how its support should be acknowledged is published at <https://science.osti.gov/funding-opportunities/acknowledgements/> and https://scidac.gov/acknowledgement_template.html

PUBLIC ACCESS

Awards made under this Announcement are subject to DOE's Public Access Plan (<https://www.energy.gov/downloads/doe-public-access-plan>). Full-text version of scientific publications must be made publicly accessible at no charge to readers.

SC STATEMENT OF COMMITMENT

The DOE SC is fully and unconditionally committed to fostering safe, diverse, equitable, and inclusive work, research, and funding environments that value mutual respect and personal integrity. Discrimination and harassment undermine SC's ability to achieve its mission by reducing productivity, discouraging, or inhibiting talent retention and career advancement, and weakening the integrity of the SC enterprise overall. SC does not tolerate discrimination or harassment of any kind, including sexual or non-sexual harassment, bullying, intimidation,

violence, threats of violence, retaliation, or other disruptive behavior in the federal workplace, including DOE field site offices, or at national laboratories, scientific user facilities, academic institutions, other institutions receiving SC funding, or other locations where activities funded by SC are carried out. All applicants and collaborators should familiarize themselves with the SC Statement of Commitment available at <https://science.osti.gov/sc-2/Research-and-Conduct-Policies/Diversity-Equity-and-Inclusion/SC-Statement-of-Commitment>.

UPDATING YOUR PAMS PROFILE

All applicants are encouraged to update their profiles in the PAMS website at <https://pamspublic.science.energy.gov> regularly, at least annually, to ensure SC has your most up to date information. The PAMS profile now requires that individuals provide responses to the demographic related fields. SC strongly encourages applicants and awardees, including Principal Investigators (PIs), Co-PIs, and other Key Personnel, to provide their demographic information. By providing your demographic information, you are assisting with SC's continued commitment to advancing diversity, equity, and inclusion in its business practices. Alternatively, for information you wish not to disclose, please select, "Do not wish to provide." Your individual demographic information will not be shared with peer reviewers and the information in your PAMS profile is protected by the requirements established in the Federal Privacy Act of 1974. Aggregate, anonymized demographic information may be shared with confidential review committees who are charged to evaluate the quality and efficacy of SC's business practices. For example, summary statistics of all applicants to or awardees selected from a particular SC Program Announcement may be reviewed by a Committee of Visitors.

PDF GENERATION

The research narrative in a proposal must be one single machine readable PDF file that contains the DOE Title Page, project narrative, biographical sketch, current and pending support, bibliography and references cited, facilities and other resources, equipment, data management plan, and other attachments. This single PDF file may not be scanned from a printed document and must be uploaded in PAMS. You are strongly encouraged to submit the combined research narrative file through a "Print to PDF" or equivalent process to ensure that all content is visible in one PDF file.

Checklist for Avoiding Common Errors:

Item	Issue
Page Limits	Strictly followed throughout proposal, including particular attention to: <ul style="list-style-type: none"> - Research Narrative - Appendix 2 Narrative, if any - Biosketches - Data Management Plan(s) (DMPs) - Letter(s) of Recommendation, if any
Personally Identifiable Information	None present in the proposal
Research Narrative	Composed of one PDF file including all appendices
Project Summary / Abstract	Name(s) of applicant, PI(s), PI's institutional affiliation(s), Co-Investigator(s), Co-Investigator's institutional affiliation(s)
DOE Title Page	Follow instructions closely
Budget	Use current negotiated indirect cost and fringe benefit rates
Budget Justification (attached to budget)	Justify all requested costs
Biographical Sketches	Follow page limits strictly and do not include list of collaborators
List of Individuals who Should not Serve as Merit Reviews	Provided as separate addendum in application
Current and Pending Support	Ensure complete listing of all activities including brief abstract of scope of work for all items listed, regardless of the source of support
Data Management Plans (DMP)	<ul style="list-style-type: none"> - If referring to an experiment's DMP, describe the relationship to the proposed research - Include a DMP even if no experimental data is expected

Section I – DOE NATIONAL LABORATORY OPPORTUNITY DESCRIPTION

GENERAL INQUIRIES ABOUT THIS ANNOUNCEMENT SHOULD BE DIRECTED TO:

Technical/Scientific Program Contacts:

Dr. Lali Chatterjee, HEP
1 301 903 0435
lali.chatterjee@science.doe.gov

Dr. Randall Lavolette, ASCR
1 301 903 5195
randall.lavolette@science.doe.gov

Dr. Jeremy Love, HEP
jeremy.love@science.doe.gov

SUMMARY

The DOE SC Programs in High Energy Physics (HEP) <https://www.energy.gov/science/hep/high-energy-physics> and Advanced Scientific Computing Research (ASCR) <https://www.energy.gov/science/ascr/advanced-scientific-computing-research> hereby announce their interest in receiving five-year, multi-institutional proposals for Scientific Computational Partnerships to the Scientific Discovery through Advanced Computing (SciDAC) program <https://www.scidac.gov/>.

This Announcement invites new research proposals for the SciDAC-5 Partnerships that enable or accelerate scientific discovery aligned with the HEP mission by productive collaborations between high energy physicists, and applied mathematicians and computer scientists from the SciDAC Institutes in order to fully exploit the capabilities of DOE HPC.

For the purposes of this Announcement, the term “DOE HPC” (i.e., DOE High-End/High-Performance Computing facilities, e.g., see <https://science.osti.gov/ascr/Facilities>) has been expanded to include the high performance production computational systems at the National Energy Research Scientific Computing Center (NERSC), as well as those existing, or planned to be available by 2022, at the Argonne Leadership Computing Facility (ALCF), Oak Ridge Leadership Computing Facility (OLCF), or similar DOE computing facilities. DOE HPC includes the exascale machines now planned for these Facilities (Perlmutter, Aurora, Frontier) within the period covered by this Announcement, please consult the following websites for further information: <https://www.nersc.gov/systems/perlmutter>, <https://alcf.anl.gov/aurora>, <https://www.olcf.ornl.gov/frontier>, <https://science.osti.gov/ascr/Facilities/User-Facilities/Upgrades>, DOE High-End/High-Performance Computing (HPC) facilities, e.g., see <https://science.osti.gov/ascr/Facilities>.

SUPPLEMENTARY INFORMATION

Background

Scientific Discovery through Advanced Computing (SciDAC) is a recognized leader in accelerating the employment of high-end/high-performance computing to advance the state of knowledge in science. SciDAC has begun its fifth instantiation (SciDAC-5) and involves all of the SC Programs in order to dramatically accelerate progress in scientific discovery through integrated collaborations between domain scientists and applied mathematicians and/or computer scientists. The collaborations enabled by the SciDAC Partnerships have successfully developed computational solutions to science challenges across the SC Programs. Through these, complex scientific or engineering computations have been employed in simulations at a level of fidelity required for the study of real-world systems. The kind of multi-disciplinary collaboration required by SciDAC Partnerships, wherein computational experts interact with scientists as peers, continues to 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.

The mission of the **High Energy Physics (HEP)** program is to understand how the universe works at its most fundamental level, which is done by discovering the elementary constituents of matter and energy, probing the interactions between them, and exploring the basic nature of space and time. Recent successes for HEP include the discovery of dark energy and the Higgs Boson.

The U.S. particle physics community's current vision for the future is embodied in the Particle Physics Project Prioritization Panel (P5) report that presents a strategy for the next decade centered on five intertwined science drivers. [https://science.osti.gov/-/media/hep/hepap/pdf/Reports/HEPAP-Assessment-of-Progress-on-2014-P5-Report-\(2020\).pdf](https://science.osti.gov/-/media/hep/hepap/pdf/Reports/HEPAP-Assessment-of-Progress-on-2014-P5-Report-(2020).pdf)

The HEP program implements the HEP mission and P5 science drivers through a program in particle physics that advances three frontiers (cosmic, energy, and intensity) of experimental scientific discovery and theoretical, computational, technological, and interdisciplinary research.

The topics for this solicitation are grounded in and inspired by the P5 Science Drivers, which for reference are as follows:

1. Use the Higgs boson as a new tool for discovery,
2. Pursue the physics associated with neutrino mass,
3. Identify the new physics of dark matter,
4. Understand cosmic acceleration: dark energy and inflation,
5. Explore the unknown: new particles, interactions, and physical principles.

Science Topics for this Announcement

Specifically, the proposal must be fully responsive to at least one of the science topics (I-III) below:

I. Integrated end-to-end simulation of conventional, hybrid, or “virtual” accelerators using DOE HPC to target Grand Challenges to advance the P5 Science Drivers. For example,

- next-generation accelerator modeling ecosystem that enables start-to-end modeling of “twin virtual particle accelerators” with tunability from ultrafast to ultraprecise predictions
- computational tools that can address increased intensity and phase-space density for accelerator & beam physics by orders of magnitude, increased control down to the level of individual particles, and the development of prediction tools capable of start-to-end virtual accelerators

II. Novel detector simulation and tracking models and data driven analysis techniques for high energy physics experiments employing DOE HPC. These include but are not limited to experiments targeting use of the Higgs Boson as a tool for discovery, understanding the physics of neutrino mass. BSM physics, the dark universe, and cosmic microwave background. For example:

- New tracking and detector simulation models that address future data challenges of HEP experiments including proposed $10\times$ LHC luminosity increase in 2025-2026
- Advanced data driven computational models for big science experiments at the HEP Cosmic, Energy, and Intensity frontiers.

III. Innovative theoretical, computational, and simulation techniques to explore the unknown including new particles, interactions, and physical principles. These include but are not limited to pursuing the physics associated with neutrino mass, cosmological simulations and emulators and models to understand cosmic acceleration, dark energy and inflation. For example:

- $g-2$ calculations at even higher precision to definitively resolve uncertainty about Hadronic Vacuum Polarization and match the expected experimental precision.
- computational methods to calculate neutrino-nucleon and perhaps neutrino-light-nucleus cross sections to support DUNE
- state-of-the-art cosmological simulations, with associated algorithmic and analysis advances in the discovery space of neutrino mass, physics of primordial fluctuations (search of non-Gaussianity), modifications of Einstein gravity, and new dark sector probes
- Optimal methods for parametric exploration, dynamical steering of targeted analysis tools, development, and optimization of new in situ analysis methods, and efficient solvers that meet the speed and complexity challenges of cosmological simulation codes needed to identify subtle signals from the nonlinear aspects of structure formation for discovery of new physics.

Open Science

SC is dedicated to promoting the values of openness in Federally-supported scientific research, including, but not limited to, ensuring that research may be reproduced and that the results of Federally-supported research are made available to other researchers. These objectives may be met through any number of mechanisms including, but not limited to, data access plans, data sharing agreements, the use of archives and repositories, and the use of various licensing schemes.

The use of the phrase “open-source” does not refer to any particular licensing arrangement but is to be understood as encompassing any arrangement that furthers the objective of openness.

Teaming Arrangements

Proposals must be multi-institutional as well as multi-disciplinary. Collaborative proposals (i.e., separate proposals from each institution) will not be accepted under this Announcement.

Multi-institutional teams must submit one proposal from a designated lead institution (see Limitations on Submissions below) with all other team members proposed as subawards. Teams must be led by a SC Laboratory (see III.A.)

Other Federal agencies, and another Federal agency’s FFRDCs¹ may be proposed as subawardees.

Note that the value of any such proposed subaward will be removed from any such prime award: DOE will make separate awards to Federally-affiliated institutions.

¹ An authoritative list of all Federally Funded Research and Development Centers (FFRDCs) may be found at <https://www.nsf.gov/statistics/ffrdclist/>

Section II – AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT

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

Any awards made under this Announcement will be subject to the provisions of the contract between DOE and the awardee National Laboratory.

B. ESTIMATED FUNDING

DOE anticipates that, subject to the availability of future year appropriations, a total of up to \$30 million in current and future fiscal year funds will be used to support awards under this Announcement. Proposers are reminded to request support from HEP and ASCR as required in Tables 1.-3. (see IV. C. 4.). The proposers should not make any assumptions about the split in the total estimated funding from HEP and ASCR, i.e., their requests for support from HEP and ASCR must be justified by the proposal itself.

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

C. MAXIMUM AND MINIMUM AWARD SIZE

(See B. Estimated Funding section above.)

The ceiling and floor described in this Announcement represent the expected range of award sizes. Proposers should request sufficient funding to achieve their proposed results.

Ceiling

\$2,000,000 per year

Floor

\$1,000,000 per year

D. EXPECTED NUMBER OF AWARDS

(See B. Estimated Funding Section above.)

Approximately 3 to 6 awards are expected.

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

E. ANTICIPATED AWARD SIZE

(See B. Estimated Funding Section above.)

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

F. PERIOD OF PERFORMANCE

(See B. Estimated Funding section above.)

DOE anticipates making awards with a project period of five years with an expected mid-term review in Year 3.

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

G. TYPE OF PROPOSAL

DOE will accept new 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. SC will request FWPs later from those selected for funding consideration under this Announcement. Each funded Lab (lead or partner) will be funded via direct FWPs.

Section III – ELIGIBILITY INFORMATION

A. ELIGIBLE APPLICANTS AND TOPICS

This is a DOE National Laboratory-only Announcement. **Only SC National Laboratories²** are eligible to submit proposals to this solicitation. 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 Principal Investigator (PI) 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.

D. LIMITATIONS ON SUBMISSIONS

- Laboratories are limited to submitting no more than two Letters of Intent (LOI), corresponding to no more than two Proposals, as the lead institution, but there is no limitation on collaborators, nor is there a limit on the number of proposals that an institution may join as a collaborator
- Each LOI (and corresponding proposal) must name exactly one Lead PI
- An individual is limited to be named as the Lead PI on no more than 1 submission (the Lead PI may appear as a collaborator on other proposals); senior investigators, other than members of the Institutes, are strongly encouraged not to participate on more than 2 submissions
- Proposals must ensure that no collaborating institution requests more funding than for the lead Laboratory; also note the qualifications for the Lead PI in the Review Criteria below
- Proposals must not be submitted by non-Laboratory institutions
- The Lead PI must be a discipline scientist in the proposed topic
- The Lead PI must not be a member of the SciDAC Institutes
- Proposals must have a clear Lead PI and a clear lead institution for the collaboration

² SC Laboratories are Ames Laboratory, Argonne National Laboratory, Brookhaven National Laboratory, Fermi National Accelerator Laboratory, Lawrence Berkeley National Laboratory, Oak Ridge National Laboratory, Pacific Northwest National Laboratory, Princeton Plasma Physics Laboratory, SLAC National Accelerator Laboratory, and Thomas Jefferson National Accelerator Facility.

Section IV – PROPOSAL AND SUBMISSION INFORMATION

A. ADDRESS TO REQUEST PROPOSAL PACKAGE

Proposal submission instructions are available in this Announcement on the DOE SC 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

LETTER OF INTENT DUE DATE

The LOI due date is printed on the cover of this Announcement.

A Letter of Intent is required and must be submitted by the date indicated on the cover of this Announcement.

The LOI is to help in planning the review and the selection of potential reviewers for the proposal. For this purpose, the LOI must include the following:

- A cover sheet (one page) containing the name and mailing address of the sponsoring institution; the planned title of the research proposal; the name, e-mail address, and telephone number of the Lead PI and Senior/Key personnel at that Laboratory expected to be involved in the proposal.
 - Also list on the cover sheet the institutional PIs and their institutions that are expected to collaborate on this proposal (or Table A below)
 - Although the proposal itself must commit to and elucidate a credible collaboration with the SciDAC-5 Institutes in order to be considered for merit review, the proposed collaboration need not be explicit in the LOI
 - we do not expect collaborations to be fully developed at the submission of the LOI, instead, we expect that these will begin to be formed after the LOIs have been received, instead, for the LOI, it is sufficient to indicate the computational topics for which collaboration would be sought
 - if the computational part of the team (i.e., applied mathematician or computer scientist) is expected to include additional non-Institute members, then those should be listed explicitly in the LOI
 - LOIs will not receive a response, i.e., they will be neither encouraged nor discouraged
 - The Lead Laboratory is limited to two LOI submissions
- This information must be followed by a clear and concise description of the objectives and technical approach of the proposed research.

- The description of the proposed research may not exceed two pages, when printed using standard letter-size (8.5 inch x 11 inch) paper with 1 inch margins (top, bottom, left, and right). The font must not be smaller than 11 point. Figures and references, if included, must fit within the two-page limit.
- After the description of the proposed research, include a listing of individuals known to be conflicted from serving as a reviewer. This list should include, for the Lead PI, the collaborating PIs, and all Senior/Key Personnel:
 - Collaborators and Co-editors: List in alphabetical order all persons (first and last name and their current organizational affiliation) who are, or who have been, collaborators or co-authors 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 PI interacted on a regular basis while the research was being done. Also, list any individuals who are currently, or have been, co-editors on a special issue of a journal, compendium, or conference proceedings during the 24 months preceding the submission of this LOI. If there are no collaborators or co-editors to report, state “None.”
 - Graduate and Postdoctoral Advisors and Advisees: List the first and last 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.
 - Personnel must be listed with their full first and last names and their institutions must be spelled out.
- The LOI must be machine-readable. Do not submit a scanned image of a printed document.

The following Tables may be used for the LOI

Table A: Team Members (Lead PI, Task Leaders and Senior/Key Personnel) on the pre-proposal and institutional affiliations

Team Members			Institution
Last Name	First Name	Title	Institution Name

Table B: Collaborators of Team Members

Collaborator			Institution
Last Name	First Name	Title	Institution Name

The LOI must be submitted electronically through the DOE SC Portfolio Analysis and Management System (PAMS) website <https://pamspublic.science.energy.gov/>.

The Lead PI must seek approval from HEP and ASCR if teaming arrangements, proposed personnel, or the anticipated title change between submitting the LOI and when a proposal is submitted. Nonetheless, additions of or changes to proposed SciDAC-5 Institute members are both acceptable and anticipated as the LOI does not require the Institute members to be specified.

Detailed instructions about how to submit an LOI are in [Section VIII](#) of this Announcement.

2. Pre-proposal

Not applicable.

C. PROPOSAL SUBMISSION AND CONTENT

1. Summary of Proposal Contents

Each proposal will contain the following sections:

- A Cover Page, entered into PAMS as structured data using the on-screen form
- Budget, entered into PAMS as structured data using the PAMS budget form
- Abstract (one page), entered into PAMS as a separate pdf
- Budget justification, entered into PAMS as a separate pdf
- Proposal, combined into a single pdf containing the following information:
 - Proposal Title Page
 - Table of Contents
 - Project Narrative (main technical portion of the proposal, including background/introduction, proposed research and methods, timetable of activities, responsibilities of key project personnel, and management plans)
 - Appendix 1: Biographical Sketch(es)
 - Appendix 2: List of Personnel Who Should Not Serve as Reviewers
 - Appendix 3: Current and Pending Support
 - Appendix 4: Bibliography and References Cited
 - Appendix 5: Facilities and Other Resources
 - Appendix 6: Equipment
 - Appendix 7: Data Management Plan
 - Appendix 8: Other Attachments (optional)

SUBMISSION INSTRUCTIONS

Completed proposals must be submitted into the DOE SC Portfolio Analysis and Management System (PAMS) at <https://pamspublic.science.energy.gov>.

Important Instructions to the Sponsored Research Office of Submitting Institutions: SC requires that you create one single machine-readable PDF file that contains the DOE Title Page, project narrative, biographical sketch, current and pending support, bibliography and references cited, facilities and other resources, equipment, data management plan, and other attachments.

This single PDF file may not be scanned from a printed document and must be uploaded in PAMS.

WARNING: The PAMS website at <https://pamspublic.science.energy.gov/> will permit you to edit a previously submitted proposal in the time between your submission and the deadline. If you choose to edit, doing so will remove your previously submitted version from consideration. If you are still editing at the time of the deadline, you will not have a valid submission. Please pay attention to the deadline.

PROPOSAL DUE DATE

The proposal due date is printed on the cover of this Announcement.

LETTERS

Do not request and do not submit any letters of endorsement. Nevertheless, each proposal must include a signed letter that commits the institution of each team member, apart from those at the Lead Laboratory, to participation in the project (one letter per institution, not per team member) if the project is recommended for funding. This letter of commitment must be signed by an official of that institution (not the PI) at the same level required for that institution to submit a proposal (e.g., for a collaborating Laboratory, typically an ALD; for a university, typically a Vice-President of Research.) Do not include such letters in the LOI, only as an appendix to the proposal.

2. Abstract

The project summary/abstract is a summary of the proposed activity suitable for distribution to the public and sufficient to permit potential reviewers to identify conflicts of interest. It must be a self-contained document. Provide the name of the applicant, the project title, the PI and the PI's institutional affiliation, any coinvestigators and their institutional affiliations, the objectives of the project, a description of the project, including methods to be employed, and the potential impact of the project (i.e., benefits, outcomes). A sample is provided below:

Project Title

A. Smith, Lead Institution (Principal Investigator)
A. Brown, Institution 2 (Co-Investigator)
A. Jones, Institution 3 (Co-Investigator)

Text of abstract

The project summary must not exceed 1 page when printed using standard letter-size (8.5 inch x 11 inch) paper with 1 inch 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.

If a proposal is recommended for award, the project summary will be used in preparing a public abstract about the award. Award abstracts and titles form a Government document that describes the project and justifies the expenditure of Federal funds in light of the DOE and SC mission statements at <https://energy.gov/mission> and <https://science.osti.gov/about/>.

- Do not include any proprietary or sensitive business information.
- DOE may use the abstract may to prepare public reports about supported research.

3. Budget and Justification

The budget must be submitted into PAMS using the PAMS budget form.

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. 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.

4. Proposal

DOE TITLE PAGE
(PART OF PROJECT NARRATIVE)

The following proposal title 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:
- DOE/SC Program Office:
- DOE/SC Program Office Technical Contact:
- PAMS Letter of Intent Tracking Number:

TITLE PAGE SUPPLEMENT FOR TEAM PROPOSALS
(PART OF PROJECT NARRATIVE)

Provide the following information on a separate page as a supplement to the title page (the title page may exceed one page because of the inclusion of the Tables below and in any case does not count against the Page Limits described below.)

- 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.
- Include all of the tables modeled on the following charts providing summary budget information from all institutions; for the last two, provide the total costs of the budget request in each year for each institution and totals for all rows and columns. All three tables are required.

TABLE 1: PERSONNEL - TEAM MEMBERS (LEAD PI, TASK LEADERS AND SENIOR/KEY PERSONNEL) ON THE APPLICATION AND INSTITUTIONAL AFFILIATIONS

Team Members			Institution
Last Name	First Name	Title	Institution Name

TABLE 2: BUDGET REQUEST BY INSTITUTION WITH INSTITUTIONAL LEAD PI (\$ IN THOUSANDS)

Institution	PI for the Institution*	Year-1 Budget HEP	Year-1 Budget ASCR	...	Year-5 HEP	Year-5 ASCR	Total HEP	Total ASCR
Total								

*Please also indicate if the Institutional PI is also the Lead PI for the application
 Example budget table (\$ in thousands)

TABLE 3: BUDGET REQUEST BY TASK* (\$ IN THOUSANDS)

Task	Task Leader	Year-1 Budget HEP	Year-1 Budget ASCR	...	Year-5 Budget HEP	Year-5 Budget ASCR	Total HEP	Total ASCR

Total								

Example budget table (\$ in thousands)

PROJECT NARRATIVE

The project narrative **must not exceed a page limit of 28 pages** of technical information, including charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard letter-size (8.5 inch x 11 inch) 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 Title Page, Budget Page(s), Budget Justification, biographical material, publications and references, and appendices, each of which may have its own page limit defined later in this Announcement.

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 Section VIII for instructions on how to mark proprietary proposal information.

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 physics research with 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. Include here a brief description of the collaboration with scientists and members of the SciDAC-5 Institutes.

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.

APPENDIX 1: BIOGRAPHICAL SKETCH

Provide a biographical sketch for the PI and each senior/key person as an appendix to your technical narrative.

- Provide the biographical sketch information as an appendix to your project narrative.
- Do not attach a separate file.
- The biographical sketch appendix will not count in the project narrative page limitation.
- The biographical information (curriculum vitae) for each person must not exceed 3 pages when printed on letter-size (8.5 inch x 11 inch) paper with 1 inch margins (top, bottom, left, and right) with font not smaller than 11 point

Detailed instructions may be found in [Section VIII](#) of this Announcement.

WARNING: These instructions have been significantly revised to require disclosure of a variety of potential conflicts of interest or commitment, including participation in foreign government-sponsored talent recruitment programs.

The PI and each senior/key person at the prime applicant and any proposed subaward must provide a list of all sponsored activities, awards, and appointments, whether paid or unpaid; provided as a gift with terms or conditions or provided as a gift without terms or conditions; full-time, part-time, or voluntary; faculty, visiting, adjunct, or honorary; cash or in-kind; foreign or domestic; governmental or private-sector; directly supporting the individual's research or indirectly supporting the individual by supporting students, research staff, space, equipment, or other research expenses. All foreign government-sponsored talent recruitment programs must be identified in current and pending support.

APPENDIX 2: LIST OF INDIVIDUALS WHO SHOULD NOT SERVE AS REVIEWERS

Provide a list of individuals who should not serve as merit reviewers of this application, following the instructions in [Section VIII](#) of this Announcement

- Do not attach a separate file.
- 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 for the PI and senior/key personnel, including subawardees. Provide the Current and Pending Support as an appendix to your project narrative. Concurrent submission of an application 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.

Detailed instructions may be found in [Section VIII](#) of this Announcement.

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 application. 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) as an appendix to the research narrative.

- This appendix should not exceed a page limit of 4 pages including charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard letter-size (8.5 inch x 11 inch) 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.

The standard requirements for a DMP may be found in [Section VIII](#) of this Announcement.

APPENDIX 7: OTHER ATTACHMENT

If you need to elaborate on your responses to the PAMS Cover Page, 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.

D. SUBMISSIONS FROM SUCCESSFUL PROPOSERS

This re-competition for SciDAC (SciDAC-5) Partnerships is open to DOE National Lab-led (see III.A) HEP-ASCR teams for furthering the HEP mission (see Science Topics in the Supplementary Information) via effective use of DOE HPC and collaborations with the SciDAC-5 Institutes.

Lead Laboratories must submit proposals on behalf of multi-institutional teams. They are strongly encouraged to engage University partners and to support DOE SC DEI guidelines <https://www.energy.gov/science/diversity-equity-inclusion>.

Universities and other non-Laboratory institutions collaborating on successful proposals ultimately would be funded via subawards from the lead Lab while participants at DOE National Laboratories would be funded through FWPs (for each Laboratory) supplied upon request (do not submit FWPs in the proposal).

Proposals should not propose work that might duplicate work being done by the HEP Center for Computational Excellence (HEP CCE) <https://www.anl.gov/hep-cce>

For this recompetition of the SciDAC Partnerships, the Lead PI, who must be a discipline scientist (representing HEP), must build a collaboration with at least one of the SciDAC Institutes (FASTMath or RAPIDS2, see links below), in order to employ the expertise of applied mathematicians or computer scientists in meaningful and integrated research. It is permitted to propose to employ the expertise of computational experts outside of the SciDAC Institutes only if it is in addition to, and not duplicative of, a credible collaboration with some members of the SciDAC Institutes.

The SciDAC program itself (<https://scidac.gov>) consists of two key components: Partnerships and Institutes. The SciDAC Partnerships, the subject of this Announcement, consist of jointly funded and managed projects that enable deep, necessary, and productive collaborations between discipline scientists (here sponsored by HEP) and applied mathematicians and/or computer scientists (sponsored by ASCR). These relationships should lead to, among other things, the full exploitation of the capabilities of DOE HPC systems as scientists work to advance the mission of HEP. The other key component is the SciDAC Institutes, whose members are all ASCR-sponsored researchers in applied mathematics or computer science. The purpose of the Institutes is “to advance scientific discovery in areas of strategic importance to DOE by providing intellectual resources in applied mathematics and computer science, expertise in algorithms and methods, and software tools for scientific problem solving, in the context of DOE HPC.”

The SciDAC-5 Institutes, recently recompiled by ASCR, consist of the following:

- **FASTMath:** Frameworks, Algorithms, and Scalable Technologies for Mathematics (Director: Esmond Ng, Lawrence Berkeley National Laboratory) <https://scidac5-fastmath.lbl.gov>
- **RAPIDS2:** Computer Science, Data, and Artificial Intelligence (Director: Rob Ross, Argonne National Laboratory) <https://rapids.lbl.gov>

In addition to traditionally strong capabilities in applied mathematics and computer science, the Institutes have enhanced their position in uncertainty quantification and AI/ML theory and practice, all of which prospective collaborators are encouraged to explore beginning with the websites mentioned above.

Successful Partnerships will:

- Exploit DOE HPC resources to advance scientific frontiers in an area of strategic importance to HEP; and
- Effectively link to the intellectual resources in applied mathematics and computer science, expertise in algorithms and methods, or scientific software tools at one, or both, of the SciDAC-5 Institutes

Successful Partnerships may also:

- Propose computational science expertise in topics for which no resources were provided by the Institutes, or,
- Propose non-duplicative computational science expertise to supplement topics for which resources are not provided by the Institutes

On the other hand, proposals may be declined without review for non-compliance with all

requirements of this solicitation. Among others, we list some examples of non-compliance particular to this solicitation:

- Topics proposed that are clearly unresponsive to those described in this solicitation
- A significant deviation of scope or team in the proposal from the LOI without approval from the Program Managers (but the addition or change of Institute members in the proposal will not be considered a deviation from the LOI, see instructions for the LOI)
- Proposals that involve duplication of HEP CCE tasks <https://www.anl.gov/hep-cce>
- Soliciting or including letters of support from non-collaborators
- Absence of an intent to advance employment of DOE HPC resources
- Absence of a Management Plan that includes a plan for collaboration between the scientists and members of SciDAC-5 Institutes in applied mathematics or computer science (but non-Institute collaborators are permitted if in addition to Institute collaborators.)
- Failure to fill out all three budget tables in the Supplement to the Title Page
- Absence of a Data Management Plan
- Absence of letters of commitment from collaborating 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.

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

The LOI due date is printed on the cover of this Announcement.

You are encouraged to submit your Letter of Intent well before the deadline. LOIs may be submitted at any time between the publication of this Announcement and the stated deadline.

2. Preproposal Due Date

Not applicable

3. Proposal Due Date

The proposal due date is printed on the cover of this Announcement.

You are encouraged to transmit your proposal well before the deadline. Proposals may be submitted at any time between the publication of this Announcement and the stated deadline.

4. Late Submissions

Delays in submitting letters of intent and proposals may be unavoidable. DOE has accepted late submissions when applicants have been unable to make timely submissions because of widespread technological disruptions, the COVID-19 pandemic, or other significant natural disasters. DOE has made accommodations for incapacitating or life-threatening illnesses and for deaths of immediate family members. Other circumstances may or may not justify late submissions. Unacceptable justifications include the following:

- Failure to begin submission process early enough.
- Failure to provide sufficient time to complete the process.
- Failure to understand the submission process.
- Failure to understand the deadlines for submissions.
- Failure to satisfy prerequisite registrations.
- Unavailability of administrative personnel.

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

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

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

Section V - PROPOSAL REVIEW INFORMATION

A. CRITERIA

1. Initial Review Criteria

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

2. Merit Review Criteria

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

- Scientific and/or Technical Merit of the Proposed Research;
- Appropriateness of the Proposed Method or Approach;
- Competency of Applicant's Personnel and Adequacy of Proposed Resources
- Reasonableness and Appropriateness of the Proposed Budget
- Effectiveness of the Management Plan
- Suitability of the Data 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 by considering both their scientific expertise and the absence of conflict-of-interest issues. Both Federal and non-Federal reviewers may be used, and submission of a 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:

SCIENTIFIC AND/OR TECHNICAL MERIT OF THE PROPOSED RESEARCH

- Is it likely that the proposed research will accelerate scientific discovery in high-energy physics by exploiting DOE HPC?
- Would the proposed research lead to significant improvements in simulation capability for physics?
- What science would become feasible that is not feasible now?
- What current bottlenecks or key uncertainties in high-energy physics research are targeted by the proposed project?
- Do the science topics proposed respond to those delineated in the Announcement?

APPROPRIATENESS OF THE PROPOSED METHOD OR APPROACH

- Does the proposal provide for a close and necessary collaboration between the physicists and the applied mathematicians or computer scientists?
- Does the proposed research exploit existing resources or contribute new state-of-the art resources (e.g., algorithms, software) for DOE HPC or would it result in a duplication of existing resources?
- Does this project plan to employ DOE HPC platforms that are currently available or are expected to be available by 2023?
- Are the results and developments likely to be used by HEP experiments to effectively use DOE HPC for advancing science?
- Does the proposed work duplicate work being carried out by HEP CCE or the HEP sub programs and thrusts?

COMPETENCY OF APPLICANT'S PERSONNEL AND ADEQUACY OF PROPOSED RESOURCES

- How well qualified is the team to carry out the proposed work?
- Does the proposed team include experts in both high-energy physics and applied mathematics or computer science? Do they have experience with DOE HPC?
- Does the team include members of the SciDAC Institutes?
 - If there are computational science collaborators who are not Institute members, would their contribution be duplicative of Institutes capabilities?
- Does the leadership appear to be qualified?
 - Is the Lead PI a scientist with expertise in the proposed science topic?
 - Would the Lead PI be likely to be successful as leader of this multi-disciplinary multi-institutional collaboration?

REASONABLENESS AND APPROPRIATENESS OF THE PROPOSED BUDGET

- Does the budget include appropriate support for all of the collaborators? (note that the budget must include support for Institute collaborators as well as science collaborators)
- Does the budget provide for adequate commitment by senior contributors?
- Does the collaboration rely upon efforts by unpaid contributors?

EFFECTIVENESS OF THE MANAGEMENT PLAN

- Does the management plan credibly enable collaboration?
- Has the proposal presented a clearly defined mechanism to evaluate success and failure and to reconfigure the project as needed?
- Does the proposal present an organizational structure that delineates the roles and responsibilities of senior/key personnel?

SUITABILITY OF THE PROPOSED DATA MANAGEMENT PLAN

- Is the Data Management Plan suitable for the proposed research?
- Does it require resources outside of the proposed project?

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. Proposals that do not pass the initial review may be declined without merit review.

2. Program Policy Factors

The Selection Official may consider any of the following program policy factors in making the selection, listed in no order of significance:

- Availability of funds
- Relevance of the proposed activity to SC priorities
- Ensuring an appropriate balance of activities within SC programs
- Performance under current awards
- Participation with multi-institutional teams
- Commitment to sharing the results of research
- Promoting the diversity of supported investigators
- Promoting the diversity of institutions receiving awards
- Hiring, promoting, and placing scientists from underrepresented communities in the scientific workforce

3. Selection

The Selection Official will consider the findings of the merit review and may consider any of the Program Policy Factors described above.

4. 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

DOE is interested in seeing projects supported under this Announcement begin work by 8/15/2022.

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. ADMINISTRATIVE AND POLICY REQUIREMENTS

The following additional policy provisions are applicable to this Announcement. The full text of each provision is in Section VIII of this Announcement and may be accessed by navigating to the hyperlinks below:

[1. Availability of Funds](#)

[2. Commitment of Public Funds](#)

[3. Environmental, Safety and Health \(ES&H\) Performance of Work at DOE Facilities](#)

[4. Evaluation and Administration by Non-Federal Personnel](#)

[5. Federal, State, and Local Requirements](#)

[6. Funding Restrictions](#)

[7. Government Right to Reject or Negotiate](#)

[8. Modification](#)

[9. Prohibition on Discrimination and Harassment](#)

[10. Proprietary Proposal Information](#)

[11. Publications](#)

[12. Research Misconduct](#)

C. 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 the Announcement number printed on the cover.

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	(HEP) Dr. Lali Chatterjee, 301-903-0435, lali.chatterjee@science.doe.gov (ASCR) Dr. Randall Laviolette, 301-903-5195, randall.laviolette@science.doe.gov

C. DEPARTMENT OF ENERGY, OFFICE OF INSPECTOR GENERAL HOTLINE:

The Office of Inspector General (OIG) maintains a Hotline to facilitate the reporting of allegations of fraud, waste, abuse, or mismanagement in DOE programs or operations. If you wish to report such allegations, you may call, send a letter, or email the OIG Hotline ighotline@hq.doe.gov. Allegations may be reported by DOE employees, DOE contractors, or the general public. OIG contact information is available at <https://energy.gov/ig/services>.

Section VIII – SUPPLEMENTARY MATERIAL

A. HOW-TO GUIDES

1. How Consortia May be Used

UNINCORPORATED CONSORTIA

Unincorporated consortia (team arrangements), which may include domestic and foreign entities, must designate one member of the consortium to serve as the prime recipient/consortium representative (lead organization). There is no requirement that subawards be formalized into unincorporated consortia.

Upon request, unincorporated consortia must provide the DOE contracting officer with a collaboration agreement, commonly referred to as the articles of collaboration, which sets out the rights and responsibilities of each consortium member. This agreement binds the individual consortium members together and should discuss, among other things, the consortium's:

- Management structure;
- Method of making payments to consortium members;
- Means of ensuring and overseeing members' efforts on the project;
- Provisions for members' cost sharing contributions; and
- Provisions for ownership and rights in intellectual property developed previously or under the agreement.

Note that a consortium is applied for in one application and results in one award with subawards to consortia members. Multi-institutional teams may, if permitted under this Announcement, submit collaborative applications with each institution submitting its own application with an identical research narrative, resulting in multiple awards to the collaborating institutions.

2. How to Submit Letters of Intent

It is important that the LOI be a single file with extension .pdf, .docx, or .doc. The filename must not exceed 50 characters. The PI and anyone submitting on behalf of the PI must register for an account in PAMS before it will be possible to submit a letter of intent. **All PIs and those submitting LOIs 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.

Submit Your Letter of Intent:

- Create your letter of intent 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 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 Letter of Intent” from the dropdown.

- On the Submit Letter of Intent page, select the institution from which you are submitting this LOI 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 PI per LOI; 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 LOI. Save the LOI for later work by clicking the “Save” button at the bottom of the screen. It will be stored in “My Letters of Intent” for later editing.
- Enter a title for your letter of intent.
- Select the appropriate technical contact from the Program Manager dropdown.
- To upload the LOI 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 LOI to DOE.
- Upon submission, the PI will receive an email from the PAMS system <PAMS.Autoreply@science.doe.gov> acknowledging receipt of the LOI.

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

WARNING: The PAMS website at <https://pamspublic.science.energy.gov/> will permit you to edit a previously submitted LOI in the time between your submission and the deadline. If you choose to edit, doing so will remove your previously submitted version from consideration. If you are still editing at the time of the deadline, you will not have a valid submission. Please pay attention to the deadline.

3. How to Submit a Pre-Proposal

It is important that the pre-proposal be a single file with extension .pdf, .docx, or .doc. The filename must not exceed 50 characters. The PI and anyone submitting on behalf of the PI must register for an account in PAMS before it will be possible to submit a pre-application. 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.

Submit Your Pre-Proposals:

- 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 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 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.

WARNING: The PAMS website at <https://pamspublic.science.energy.gov> will permit you to edit a previously submitted pre-application in the time between your submission and the deadline. If you choose to edit, doing so will remove your previously submitted

version from consideration. If you are still editing at the time of the deadline, you will not have a valid submission. Please pay attention to the deadline.

4. How to Prepare and Submit a Proposal

SUBMITTING A PROPOSAL

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. SC will request FWPs later from those selected for funding consideration under this Announcement.

PROPOSAL PREPARATION

All files submitted a part of a proposal must be PDF files 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 use PDF portfolios or binders.

Please note the following restrictions that apply to the names of all files attached to your application:

- Please limit file names to 50 or fewer characters
- Do not attach any documents with the same name. All attachments must have a unique name.
- Please use only the following characters when naming your attachments: A-Z, a-z, 0-9, underscore, hyphen, space, period, parenthesis, curly braces, square brackets, ampersand, tilde, exclamation point, comma, semi colon, apostrophe, at sign, number sign, dollar sign, percent sign, plus sign, and equal sign. Attachments that do not follow this rule may cause the entire application to be rejected or cause issues during processing.

RESUBMISSION OF PROPOSALS

Proposals submitted under this announcement may be withdrawn from consideration by using the PAMS website at <https://pamspublic.science.energy.gov>. Proposals may be withdrawn at any

time between when the applicant submits the proposal and when DOE makes the proposal available to merit reviewers. Such withdrawals take effect immediately and cannot be reversed. Please exercise due caution. After the proposal is made available to merit reviewers, the applicant may contact the DOE program office identified in this Announcement to request that it be withdrawn.

After a proposal is withdrawn, it may be resubmitted, if this Announcement is still open for the submission of applications. Such resubmissions will only count as one submission if this Announcement restricts the number of proposal from an applicant.

IMPROPER CONTENTS OF PROPOSALS

Proposals submitted under this Announcement will be stored in controlled-access systems, but they may be made publicly available if an award is made. As such, it is critical that applicants follow these guidelines:

- Do not include information subject to any legal restriction on its open distribution, whether classified, export control, or unclassified controlled nuclear information.
- Do not include sensitive and protected personally identifiable information, including social security numbers, birthdates, citizenship, marital status, or home addresses. Pay particular attention to the content of biographical sketches and curriculum vitae.
- Do not include letters of support from Federal officials.
- Do not include letters of support on Federal letterhead. Letters that are not letters of support (such as letters confirming access to sites, facilities, equipment, or data; or letters from cognizant contracting officers) may be on Federal letterhead.
- Clearly mark all proprietary or trade-secret information.

5. How to Prepare a Biographical Ssketch

A biographical sketch is to 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.

SC requires the use of the format approved by the National Science Foundation (NSF), which may be generated by the Science Experts Network Curriculum Vita (SciENCv), a cooperative venture maintained at <https://www.ncbi.nlm.nih.gov/sciencv/>, and is also available at <https://nsf.gov/bfa/dias/policy/nsfapprovedformats/biosketch.pdf>. The use of a format required by another agency is intended to reduce the administrative burden to researchers by promoting the use of common formats.

The biographical information (curriculum vitae) must include the following items within its page limit:

- **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.

Personally Identifiable Information: Do not include sensitive and protected personally identifiable information including social security numbers, birthdates, citizenship, marital status, or home addresses. Do not include information that a merit reviewer should not make use of.

6. How to Prepare a List of Individuals Who Should Not Serve as Reviewers

To assist in identifying individuals who should not serve as merit reviews, provide the following information for each and every senior/key person who is planned to be or is identified in budget for the applicant and any proposed subrecipients:

- Advisees (graduate students or postdocs) of the senior/key person
- Advisors of the senior/key person while a graduate student or a postdoc
- Close associates of the senior/key person over the past 48 months
- Co-authors of the senior/key person over the past 48 months
- Co-editors of the senior/key person over the past 48 months
- Co-investigators of the senior/key person over the past 48 months
- Collaborators of the senior/key person over the past 48 months

Do not identify any personnel at the applicant institution or any proposed subrecipient or team institution: Those personnel are prohibited from serving as merit reviewers.

Large collaborations of 10 or more researchers do not require that all collaborators be identified: rather, only list the researchers with whom the senior/key person actually collaborated.

For all identified individuals, provide the following information:

- The senior/key person to whom the individual was an advisee, advisor, close associate, co-author, co-editor, co-investigator, or collaborator, identified by first name and last name
- The individual's first (given) name
- The individual's last (family) name
- The individual's Open Researcher and Contributor ID (ORCID), if known
- The individual's institutional affiliation spelling out acronyms (For joint appointments, separate each institution with a slash ("/"). Do not list departmental affiliations.)
- The reason for listing the individual (advisee, advisor, close associate, co-author, co-editor, co-investigator, collaborator)
- The year when the individual last was a close associate, co-author, co-editor, co-investigator, or collaborator

You may also provide a list of all senior/key personnel who are planned to be or are identified in the budget for the applicant and any proposed subrecipients.

The lists do not need to be sorted in any method.

The lists must be submitted in tabular format, preferably as Microsoft Excel (.xls or .xlsx) files.

For your convenience, a template is available at <https://science.osti.gov/grants/Policy-and-Guidance/Agreement-Forms>.

You may be asked to provide the Excel files by email.

7. How to Prepare Current and Pending Support

WARNING: These instructions have been significantly revised to require disclosure of a variety of potential conflicts of interest or commitment, including participation in foreign government-sponsored talent recruitment programs.

Current and Pending support is intended to allow the identification of potential duplication, overcommitment, potential conflicts of interest or commitment, and all other sources of support. The PI and each senior/key person at the prime applicant and any proposed subaward must provide a list of all sponsored activities, awards, and appointments, whether paid or unpaid; provided as a gift with terms or conditions or provided as a gift without terms or conditions; full-time, part-time, or voluntary; faculty, visiting, adjunct, or honorary; cash or in-kind; foreign or domestic; governmental or private-sector; directly supporting the individual's research or indirectly supporting the individual by supporting students, research staff, space, equipment, or other research expenses. All foreign government-sponsored talent recruitment programs must be identified in current and pending support.

SC requires the use of the format approved by the National Science Foundation (NSF), which may be generated by the Science Experts Network Curriculum Vita (SciENCv), a cooperative venture maintained at <https://www.ncbi.nlm.nih.gov/sciencv/>, and is also available at <https://www.nsf.gov/bfa/dias/policy/nsfapprovedformats/cps.pdf>. The use of a format required by another agency is intended to reduce the administrative burden to researchers by promoting the use of common formats.

For every activity, list the following items:

- The sponsor of the activity or the source of funding
- The award or other identifying number
- The title of the award or activity
- The total cost or value of the award or activity, including direct and indirect costs. For pending proposals, provide the total amount of requested funding.
- The award period (start date – end date).
- The person-months of effort per year being dedicated to the award or activity

- Briefly describe the research being performed and explicitly identify any overlaps or synergies with the proposed research.

Details of any obligations, contractual or otherwise, to any program, entity, or organization sponsored by a foreign government must be provided on request to either the applicant institution or DOE.

8. How to Prepare a Data Management Plan

In general, a DMP should address 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 open, machine-readable, and digitally accessible to the public at the time of publication. This includes data that are displayed in charts, figures, images, etc. In addition, the underlying digital research data used to generate the displayed data should be made as accessible as possible to the public in accordance with the principles stated in the Office of Science Statement on Digital Data Management (<https://science.osti.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 at <https://science.osti.gov/user-facilities/>.
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, and regulations. There is no requirement to share proprietary data.

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

9. How to Prepare a Budget and Justification

The following advice will improve the accuracy of your budget request:

- Funds requested for personnel (senior, key, and other) must be justified as the product of their effort on the project and their institutional base salary.
- Funds requested for fringe benefits must be calculated as the product of the requested salary and, if present, the negotiated fringe benefit rate contained in an institution's negotiated indirect cost rate agreement.
- Funds requested for indirect costs must be calculated using the correct indirect cost base and the negotiated indirect cost rate.
- You are encouraged to include the rate agreement used in preparing a budget as a part of the budget justification.
- Do not prepare a budget justification using the expired DOE form F4260.1.

Budget Fields

Section A Senior/Key Person	For each Senior/Key Person, enter the requested information. List personnel, base salary, the number of months that person will be allocated to the project, requested salary, fringe benefits, and the total funds requested for each person. The requested salary must be the product of the base salary and the effort. Include a written narrative in the budget justification that justifies the need for requested personnel. Within the justification, explain the fringe benefit rate used if it is not the standard faculty rate.
Section B Other Personnel	List personnel, the number of months that person will be allocated to the project, requested salary fringe benefits, and the total funds requested for each person. Include a written narrative in the budget justification that fully justifies the need for requested personnel. Within the justification, provide the number of positions being filled in each category of other personnel.
Section C Equipment	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, unless a different threshold is specified in a negotiated Facilities and Administrative Cost Rate. (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. Do not aggregate items of equipment. Allowable items ordinarily will be limited to research equipment and apparatus not already available for the conduct of the work. General-purpose office equipment is not eligible for support unless primarily or exclusively used in the actual conduct of scientific research.
Section D Travel	For purposes of this section only, travel to Canada or to Mexico is considered domestic 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 the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or

	<p>some other basis). 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. Domestic travel is to be justified separately from foreign travel. Within the budget justification, detail the number of personnel planning to travel and the estimated per-traveler cost for each trip.</p>
<p>Section E Participant/Trainee Support Costs</p>	<p>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.</p> <p>Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis).</p>
<p>Section F Other Direct Costs</p>	<ul style="list-style-type: none"> • 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. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). • 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. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). • 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. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). • 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. Indicate the basis for the

	<p>cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis).</p> <ul style="list-style-type: none"> • 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. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). • 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 through F). PAMS will automatically calculate this.
Section H Other Indirect Costs	Enter the Indirect Cost information, including the rates and bases being used, for each field. Only four general categories of indirect costs are allowed/requested on this form, so please consolidate if needed. Include the cognizant Federal agency and contact information if using a negotiated rate agreement. Within the budget justification, explain the use of multiple rates, if multiple rates are used.
Section I Total Direct and Indirect Costs	This is the total of Sections G and H. PAMS will automatically calculate this.

10. How to Register in PAMS

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

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

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.

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 to the “Having Trouble Logging In?” page. (If you have been an SC merit reviewer or if you have previously submitted an application, 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.

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 Announcement should reference the number printed on the cover page.

11. How to View Proposals in PAMS

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

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

B. POLICY PROVISIONS

1. 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.

2. 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.

3. Environmental, Safety and Health (ES&H) Performance of Work at DOE Facilities

With respect to the performance of any portion of the work under this award which is performed at a DOE-owned or controlled site, the recipient agrees to comply with all state and Federal ES&H regulations, and with all other ES&H requirements of the operator of such site.

Prior to the performance on any work at a DOE-Owned or controlled site, the recipient shall contact the site facility manager for information on DOE and site specific ES&H requirements.

The recipient shall apply this provision to all subawardees at any tier.

4. 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 a conflict of interest and a certificate of confidentiality prior to reviewing a proposal. Non-Federal personnel conducting administrative activities must sign a non-disclosure agreement.

5. Federal, State, and Local Requirements

With respect to the performance of any portion of the work under this award, the recipient agrees to comply with all applicable local, state, and Federal ES&H regulations. The recipient shall apply this provision to all sub awardees at any tier.

6. 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.

7. 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.

8. Modification

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

9. Prohibition on Discrimination and Harassment

All people conducting, supporting, or participating in scientific research under this award must be able to do so on the basis of their abilities and without any unnecessary barriers. Recipients of awards resulting from this FOA are prohibited from engaging in discrimination on any basis prohibited by law, including harassment (sexual or non-sexual) as contained in 10 CFR 1040, 1041, and 1042.

Recipients may contact the DOE's Office of Civil Rights for technical assistance in meeting their institutional requirements under these regulations, including assistance in addressing complaints of discrimination or harassment (<https://www.energy.gov/diversity/title-ix>). The United States Equal Employment Opportunity Commission also makes a number of resources available at <https://www.eeoc.gov/eeoc/publications/index.cfm> to ensure that employees may perform their work without hindrance. Graduate students and post-doctoral researchers are understood to have a dual role as both trainees and employees, in accordance with 2 CFR 200.400 (f).

10. 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 any document included in the proposal that contains such proprietary information and specifies the pages of the document which are to be restricted:

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

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

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

11. Publications

Researchers are expected to publish or otherwise make publicly available the results of the work conducted under any authorization resulting from this Announcement. Publications and other methods of public communication describing any work based on or developed under an authorization resulting from this Announcement must contain an acknowledgment of SC support. The format for such acknowledgments is provided at <https://science.osti.gov/funding-opportunities/acknowledgements/> and <https://scidac.gov>. The author’s copy of any peer-reviewed manuscript accepted for funding must be announced to DOE’s Office of Scientific and Technical Information (OSTI) and made publicly available in accordance with the instructions contained in the Reporting Requirements Checklist incorporated in all Assistance Agreements.

12. Research Misconduct

Scientific discoveries can only take place when scientific research is conducted in a fair, transparent, and honestly reported manner. Any form of dishonesty—whether plagiarism, falsifying results, or misrepresenting conditions—makes it impossible to advance our understanding of the physical universe.

Recipients are “responsible for maintaining the integrity of research of any kind under an award from DOE including the prevention, detection, and remediation of research misconduct, and the conduct of inquiries, investigations, and adjudication of allegations of research misconduct,” and conducting appropriate administrative processes in response to allegations of research misconduct in accordance with 2 CFR 910.132. Allegations of any misconduct under an award resulting from this FOA must be reported to the appropriate institutional officials in accordance

with institutional policies against misconduct. Additional information on DOE research misconduct policies can be found at: <https://science.osti.gov/grants/Policy-and-Guidance/Research-Misconduct>.