Department of Energy (DOE)
Office of Science (SC)
Advance Scientific Computing Research (ASCR)

Competitive Portfolios for Advanced Scientific Computing Research: Data Management and Visualization

DOE National Laboratory Program Announcement Number: LAB 25-3520

Announcement Type: Amendment 000001

Amendment 000001 is issued to remove references to diversity, equity, and inclusion; and to remove references to PIER plans

Announcement Issue Date:	**January 13, 2025**
Submission Deadline for Letter of Intent:	**Tuesday, March 11, 2025 at 5 PM ET** **A Letter of Intent is required** Letters of Intent must be submitted by an authorized institutional representative
Letter of Intent Response Date	**Wednesday, April 2, 2025 at 11:59 PM ET**
Submission Deadline for Proposals:	**Tuesday, May 13, 2025 at 5 PM ET**

Table of Contents

I. Basic Information

U.S. Department of Energy (DOE)
Office of Science (SC)

Executive Summary

The SC Advanced Scientific Computing Research (ASCR) program hereby announces its interest in advanced scientific computing research portfolios for accelerating discovery and innovation in support of the DOE mission. ASCR seeks to invest in DOE National Laboratory-led portfolios that balance long-term, high-impact research along with the ability to aggressively respond to, and take advantage of, emerging science and technology trends. For this Announcement, single-faceted computer-science-driven thrusts are required which build research expertise in core areas such as AI-enabled peta- to exa-scale scientific data management and scientific visualization.

Funding Details

Expected total available funding	$35,000,000
Expected number of awards	3-4
Expected dollar amount of individual awards	$500,000 - $4,000,000 per year
Expected award project period	5 years

Key Facts

Announcement Title	Competitive Portfolios for Advanced Scientific Computing Research
Announcement Number	LAB 25-3520
Announcement Type	Amendment 000001

Key Dates

Key dates are printed on the cover of this Announcement.

Agency Contact Information

PAMS Customer Support	855-818-1846 (toll-free) 301-903-9610 sc.pams-helpdesk@science.doe.gov
Technical/Scientific Program Contact	Dr. Hal Finkel [Primary] hal.finkel@science.doe.gov Dr. Margaret Lentz margaret.lentz@science.doe.gov Dr. Kalyan Perumalla kalyan.perumalla@science.doe.gov

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.

Recommendation

SC encourages you to register in all systems as soon as possible. You are also encouraged to submit letters of intent (LOIs) and proposals well before the deadline.

II. Eligibility

A. Eligible Applicants

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

B. Cost Sharing

Cost sharing is not required.

C. Eligible Individuals

Eligible individuals with the skills, knowledge, and resources necessary to carry out the proposed research as a 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

Applicant institutions are limited to no more than *one* letter of intent and proposal as the lead institution.

There is no limitation to the number of proposals on which an institution appears as a subrecipient.

Should DOE receive submissions in excess of the applicable limits, DOE reserves the right, in its sole discretion, to request additional or clarifying information to ascertain the institution's intended submissions. Otherwise, DOE will consider the latest received submissions to be the institution's intended submissions.

- Letters of intent in excess of the limited number of submissions will be discouraged.
- Proposals in excess of the limited number of submissions will be declined without review.

LIMITATIONS ON PI

The PI is expected to be a laboratory division director or a manager with equivalent supervisory responsibilities.

PIs must be in a permanent position at the applicant institution, whether tenured, tenure-track, or a staff appointment. Individuals in term-limited appointments whether as adjunct, visiting faculty, fellows, or similar appointments, are not eligible to be proposed as a PI.

Individuals receiving less than half of their salary and benefits from a DOE/NNSA National Laboratory may not be named as the PI in a proposal under this Announcement, regardless of any arrangement between the Laboratory and another institution.

III. Program Description

A. Purpose

The SC ASCR program hereby announces its interest in advanced scientific computing research portfolios for accelerating discovery and innovation in support of the DOE mission. ASCR seeks to invest in DOE National Laboratory-led portfolios that balance long-term, high-impact research along with the ability to aggressively respond to, and take advantage of, emerging science and technology trends. The ASCR Computer Science (CS) research program [1] supports long-term, basic research that enables computing and networking at extreme scales and the understanding of extreme-scale and complex data from both simulations and experiments. ASCR, in tandem with industry and others, has made highly successful investments to ensure U.S. leadership in high performance computing (HPC), which resulted in Exascale systems that are enabling scientific discovery and decision support through data integration, simulation and modeling [2].

To ensure continued leadership in delivering on the promise of computational science, and drive innovation in energy-efficient and versatile HPC for science, ASCR seeks to invest in DOE National Laboratory-led portfolios that:

- Support long-term, high-impact CS research,
- Aggressively respond to, and take advantage of, emerging science and technology needs and trends including Artificial Intelligence (AI), and
- Collaborate with a broad community of the most-promising academic and industry partners

SUPPLEMENTARY INFORMATION

Scientific research driven by Artificial Intelligence (AI)-enabled technologies is not only making scientists more productive but promises to change how scientists find the most-promising ideas to investigate in the future [3]. This requires deep changes in the methods available, and algorithms developed, to store, search, retrieve, analyze, and visualize scientific data. Past efforts which focused primarily on storing and analyzing data quickly only in specifically-anticipated contexts are giving way to discovery-optimized techniques which prioritize supporting AI-enabled investigation and the aggregation of curated data sets of many kinds.

In this context, ASCR seeks innovative research with vision beyond its current investments in HPC data management, storage [4], and scientific visualization [5] that will help enable the development of the next-generation energy-efficient and capable computing systems [6] and approaches enabling accelerated scientific discovery. This can include the use of new hardware, software, algorithms, and other related technologies that are currently at early stages of development.

While proposed work can leverage software from prior research efforts where they add significant value, ASCR is primarily looking for new research efforts in scientific data management, storage, and visualization. These efforts should build on the best available open platforms and befit the future of energy-efficient AI-driven scientific discovery where data management and visualization are fast, efficient, and flexible.

Research Priorities: The research proposed may cover any of the areas below:

2. Next-Generation Converged Scientific Data Management and Novel Analytics Approaches

Next-generation scientific data management must productively allow scientists and engineers to store, search, and analyze large scale, multi-modal scientific data (petabytes and beyond) produced by a variety of different experiments and simulations across the world for AI-driven discovery. The performance requirements are expected to push the boundaries of what is currently possible technologically, and at the same time, incorporate the latest AI and analytics techniques, and develop new techniques, to permit both state-of-the-art targeted analyses along with enhanced provenance to ensure scientific reproducibility and enable broad AI-driven exploration.

Responsive proposals may address any (single or combination) of the Priority Research Directions (PRDs) from the January 2022 "Report for the ASCR Workshop on the Management and Storage of Scientific Data" [4]. Just as scientific computing builds on advancements from the wider computing ecosystem, so too must our scientific data-management and analytics ecosystem. Additionally, recent years produced an explosion of databases and data-management software, including many designed to scale to manage multi-petabyte data sets, and many designed for distributed environments, which has transformed the broader computing ecosystem. Now with the growing prevalence of vector databases and other technologies focused on AI integration, that ecosystem is growing yet again. Moreover, a significant body of this software is open source, providing key opportunities for productive and impactful research, and research that is embodied within a highly-expressive capability ecosystem that helps ensure broadly valid and applicable findings. Accordingly, preference will be given to research that, at least in part, builds on widely-used open-source[1] database and data-management software, especially on software offering a higher-level interface to distribute, search, and/or analyze data. Given the large amount and variety of such software, an enumeration of such software in this Announcement is not feasible[2].

2. Next-Generation Scientific Data Visualization and Data Analytics

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[1] As noted under the Open Science heading in this subsection, the use of "open source" does not indicate a preference toward a particular licensing scheme. Moreover, ASCR recognizes the growing use of "source available" and similar licenses in the data-management area, and for the purposes of this Announcement, building on software distributed under such schemes, in cases where the copyright holder is a collaborator, will be given the same preference as open-source schemes.

[2] While a complete listing is not practical, some websites offering incomplete listings include the following, noting that not all projects listed on these pages are wholly relevant in this context: https://db-engines.com/en/ranking; https://stackshare.io/data-stores; https://github.com/topics/distributed-database; https://github.com/oxnr/awesome-bigdata; https://github.com/agarcialeon/awesome-database; https://github.com/merdoyovski/awesome-database; https://github.com/mileszim/awesome-vector-database; https://github.com/dangkhoasdc/awesome-vector-database; https://github.com/fffaraz/awesome-cpp?tab=readme-ov-file#database; https://github.com/nschloe/awesome-scientific-computing?tab=readme-ov-file#data-formats; https://github.com/kmhernan/awesome-bioinformatics-formats?tab=readme-ov-file#general; https://github.com/sacridini/Awesome-Geospatial?tab=readme-ov-file#database.

Visualization of data is a powerful means of communication and is essential to the scientific process; allowing scientists, engineers, students, and other stakeholders to explore data, form hypotheses, enable decision support, and convey conclusions to a broad spectrum of audiences. This is especially true in the team-based, cross-disciplinary environment of the many cutting-edge, large-scale projects funded by the DOE.

The need for focused investments in technical advancements in visualization for HPC has occurred due to multiple factors. Some of these include the increasing complexity of data and volume of scientific data, the need for visualization of uncertainty to help enable decision support, and the proliferation of new visualization technologies (e.g. virtual reality, augmented reality, holography) [5]. Recent advancements in AI (generative AI, large language models, etc.) still require further study and validation to ensure their trustworthy integration, so they can aid in simulation development, decision support and understand complex systems (e.g., lab automation, digital twins) [3, 5, 7]. Moreover, the need for human centric and interoperable design in visualization tools for scientific computing and simulations is key to avoiding bespoke solutions that limit the engagement of a broader range of domain scientists and others. It is also recognized that there is an increasing demand for intuitive visualization that can communicate complex relations not just to scientists across domains, but also to policy makers and the public writ large.

Responsive proposals may address these and any (single or combination) of the Priority Research Directions (PRDs) from the March 2023 Technical Report "Visualization for Scientific Discovery, Decision-Making and Communication" [5].

Research Proposals: This Announcement builds on ASCR's existing Competitive Portfolios program, and accordingly, each Laboratory is limited to leading one proposal in response to this Announcement. The Principal Investigator (PI) must be a Laboratory division director or a manager with equivalent supervisory responsibilities. The proposal narrative (at most 18 pages) must provide a Laboratory vision and management plan for the portfolio of capabilities stemming from the proposed research and development in scientific computing. The narrative is comprised of at least one, and no more than three, research thrusts.[3] Each thrust must have a Laboratory Senior/Key Personnel (SKP) as the Lead along with other SKPs and researchers. Overall, the proposal must describe the research Thrusts and Integration Tasks needed to enable new scientific computing-based capabilities that address national priorities in energy, the environment, and national security. The proposal should describe how the overall vision and each Thrust take advantage of the responding Laboratory's, and each partnering institution's, distinctive expertise and capabilities.

Integration Tasks: For each proposed research thrust, its individual role as a key enabling technology in scientific computing – and potential integration with other research thrusts and DOE plans or priorities – must be described. Integration with thrusts funded under prior Competitive Portfolios announcements, where appropriate, is encouraged.

[3] A research thrust is a distinct, focused area of basic research in scientific computing.

External Collaborator Required: Responsive proposals must include at least one external collaborator for any proposed research thrust. External in this context means any collaborator from outside the DOE laboratory complex[4]. The collaborators, collectively, are expected to bring:

1. Knowledge of existing codebases, a broad perspective on the needs of different user communities, and software-engineering expertise.
2. Knowledge helpful for accelerating the maturation and wider dissemination of successful research results.

Successful research proposals should consider the impact of the research on next generation computing systems and a description of how the proposed external collaborations are important to enhance this impact.

Industry Participation Required: All thrusts must propose specific industry participation, either as external collaborators or in advisory roles. ASCR expresses no general preference for whether industry participants are funded or are covering their own costs, recognizing the most appropriate arrangements will depend on the details of the proposed work. Regardless, work proposed must not be a supplement to current industry investment, but rather, explore new areas on the scientific frontier.

Proposals shall discuss technical and programmatic risk factors and the strategy to manage and to mitigate risk. The amount of risk must be commensurate with the potential impact. Higher risk projects are acceptable if the potential impact of the project is also high.

Out of Scope

- Thrusts that do not include the priority research areas and have appropriate external collaborators proposed will be viewed as out of scope and may be declined in the ASCR response to the LOIs.
- Thrusts not considered to be innovative will be viewed as out of scope and may be declined in the ASCR response to the LOIs.

References

[1] "ASCR Computer Science Program," https://science.osti.gov/ascr/Research/Computer-Science
[2] "Exascale Computing Project," https://www.exascaleproject.org/
[3] Report for the 2022 Workshop Series "Advanced Research Directions on AI for Science, Energy and Security," https://www.anl.gov/sites/www/files/2023- 06/AI4SESReport-2023-v6.pdf
[4] Report for the 2022 ASCR Workshop on "Management and Storage of Scientific Data," https://doi.org/10.2172/1845707
[5] Report for the 2022 ASCR Workshop on "Visualization for Scientific Discovery, Decision-Making and Communication," https://doi.org/10.2172/1845708

[4] Individuals with a joint appointment at any DOE National Laboratory cannot fulfill the external-collaborator requirement, regardless of through what institution they plan to contribute to the proposed research.

[6] Website information for the 2024 ASCR Workshop on "Energy Efficient Computing for Science," (Workshop Report and Brochure to be posted)
https://www.orau.gov/2024EECWorkshop
[7] Report for the 2020 ASCR Workshop on "Envisioning Science in 2050 – Report of a Community of Interest Workshop on Future Scientific Methodologies,"
https://www.osti.gov/servlets/purl/1871683

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.

Multi-Institutional Teams

SC uses two different mechanisms to support teams of multiple institutions.

COLLABORATIVE PROPOSALS

Collaborative proposals will not be accepted under this Announcement.

SUBAWARDS

Multi-institutional teams may submit one proposal from a designated lead institution with all other team members proposed as subawards.

Other Federal agencies, and another Federal agency's FFRDCs[5] 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.

B. Program Goals, Objectives, and Priorities

The Office of Science's (SC) mission is to deliver scientific discoveries and major scientific tools to transform our understanding of nature and advance the energy, economic, and national security of the United States (U.S.). SC is the Nation's largest Federal sponsor of basic research

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

in the physical sciences and the lead Federal agency supporting fundamental scientific research for our Nation's energy future.

SC accomplishes its mission and advances national goals by supporting:

- The frontiers of science—exploring nature's mysteries from the study of fundamental subatomic particles, atoms, and molecules that are the building blocks of the materials of our universe and everything in it to the DNA, proteins, and cells that are the building blocks of life. Each of the programs in SC supports research probing the most fundamental disciplinary questions.
- The 21st Century tools of science—providing the nation's researchers with 28 state-of-the-art national scientific user facilities, the most advanced tools of modern science, propelling the U.S. to the forefront of science, technology development, and deployment through innovation.
- Science for energy and the environment—paving the knowledge foundation to spur discoveries and innovations for advancing the Department's mission in energy and environment. SC supports a wide range of funding modalities from single principal investigators to large team-based activities to engage in fundamental research on energy production, conversion, storage, transmission, and use, and on our understanding of the earth systems.

SC is an established leader of the U.S. scientific discovery and innovation enterprise. Over the decades, SC investments and accomplishments in basic research and enabling research capabilities have provided the foundations for new technologies, businesses, and industries, making significant contributions to our nation's economy, national security, and quality of life

C. Program History

You can learn about SC's history at https://science.osti.gov/About/History. You can read about our achievements at https://science.osti.gov/Science-Features/Science-Highlights. You can find information about all of our awards at https://pamspublic.science.energy.gov/WebPAMSExternal/interface/awards/AwardSearchExternal.aspx.

D. Other Information

Anticipated Award Size

The award size will depend on the number of meritorious proposals and the availability of appropriated funds.
Note that the ceiling and floor specified below apply to each institution's proposed budget inclusive of any proposed subawards.

It is anticipated that award sizes may range from $1,500,000 per year to $3,000,000 per year, typically less than $4,000,000 per year.

Ceiling

$6,000,000 per year

As described in Section III.A, each proposal will be divided into no more than 3 thrusts. The budget for each thrust may not exceed $2,000,000 per year. *ASCR intends to award no more than $4,000,000 per year across all thrusts described in each proposal.* This means that, for example, if the total proposed budget is $6,000,000 per year, ASCR intends to award no more than two thirds of the funding requested for a negotiated subset of the work proposed.

Floor

$500,000 per year

As described in Section III, each proposal will be divided into one or more Thrusts. The budget for each thrust may not be less than $500,000 per year.

PERIOD OF PERFORMANCE

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

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

IV. Proposal Contents and Format

A. Preliminary Submissions

1. Letter of Intent (LOI)

LETTER OF INTENT DUE DATE

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

RESPONSE DATE

The response date is printed on the cover of this Announcement. Applicants who have not received a response regarding the status of their LOI by this date are responsible for contacting the program manager to confirm this status.

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.

The LOI must include the following information on a cover page:

Title of LOI
Principal Investigator Name, Job Title
Institution
PI Phone Number, PI Email Address
Announcement Number: Include the Number indicated on the cover of this Announcement

The material listed here defines the minimum acceptable information on a cover page. Cover page does not count in the page limitation. Additional information may be provided at the applicant's discretion.

- Include a list of all known senior/key personnel at the applicant institution and all team member institutions on the cover page.
- 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 three pages, when printed using standard letter-size (8.5-inch x 11-inch) paper with 1-inch margins (top, bottom, left, and right). The body text font must not be smaller than 11-point. Figures and references, if included, must fit within the three-page limit.

If a multi-institutional team is being proposed, provide the following information on a separate page. This information will not count toward the page limitation.

- List all institutions by name with each institution's PI on the same line.
- Indicate the lead PI who will be the point of contact and coordinator for the combined research activity.
- Include a table modeled on the following chart providing summary budget information from all institutions. Provide the total costs of the budget request in each year for each institution and totals for all rows and columns.

	Lead PI/Co-PI	**Year 1 Budget**	**Year 2 Budget**	**Year 3 Budget**	**Year 4 Budget**	**Year 5 Budget**	**Total Budget**
Lead Institution							
Institution							
Institution							
Institution							

Example budget table ($ in thousands)

In addition, the LOI must include a listing of senior/key personnel and a listing of individuals who should not serve as merit reviewers of a subsequent proposal. Detailed instructions for how to craft such a listing are provided in Section IX of this Announcement. **Note that the listing of individuals who should not serve as merit reviewers is rarely empty because the instructions contain mandatory inclusions requirements.** This listing will not count toward the LOI's page limit. The list of individuals must be included in Excel format using the template available from https://science.osti.gov/-/media/grants/excel/Collaborator_Template.xlsx as an "Additional Attachment" to your LOI in PAMS. As described in Section IX.C.3, these Excel files should contain, when known, the digital persistent identifiers, including the Open Researcher and Contributor ID (ORCiD), of all listed individuals.

LOI REVIEW

Program Managers may evaluate all or some portion of LOIs to determine their competitiveness within a scientific topic.

Any review will be based on the following criteria:
1. Responsiveness to the objectives of the Announcement.
2. Scientific and technical merit.
3. Appropriateness of the proposed research approaches.
4. Likelihood of scientific impact.

Any such review will be conducted by no less than three federal program managers chosen for their topical knowledge and diversity of perspective.

Reviews within a topical field will be a comparative review with priority given to scientifically innovative and forward-looking basic research with the highest likelihood of success as a proposal. The results of the review will be documented.

Applicants with the highest rated LOIs will be encouraged to submit proposals; others will be

discouraged from submitting proposals. Individual thrusts proposed in LOIs may be discouraged from submitting.

Written feedback about LOIs will be provided by the date printed on the cover of this Announcement.

SC is committed to ensuring that a sufficient number of applicants will be encouraged to submit proposals to foster a competitive merit review of the proposals. SC's intent in discouraging submission of certain proposals is to save the time and effort of applicants in preparing and submitting proposals with a negligible likelihood of success.

The PI will be automatically notified when the LOI is encouraged or discouraged. The DOE SC Portfolio Analysis and Management System (PAMS) will send an email to the PI from PAMS.Autoreply@science.doe.gov, and the status of the pre-proposal will be updated at the PAMS website https://pamspublic.science.energy.gov/. Notifications are sent as soon as the decisions to encourage or discourage are finalized.

LOI SUBMISSION

LOIs are created in the software system of your choice and must be submitted electronically through the DOE SC Portfolio Analysis and Management System (PAMS) website https://pamspublic.science.energy.gov/. You cannot draft or edit an LOI in PAMS. Do not submit an LOI through FedConnect or Grants.gov.

LOIs may only be submitted by a user at the PI's institution with the "Submit to DOE" privilege in PAMS. A PI may draft a LOI but will only be able to submit the LOI for institutional countersignature.

Applicants are strongly encouraged to inform their DOE Program Manager if teaming arrangements, proposed personnel, topics, or the anticipated title change between submitting the LOI and when a proposal is submitted, to ensure that their proposal is properly linked to their LOI and that reviewers are properly assigned to the proposal.

Detailed instructions about how to submit an LOI are in Section IX of this Announcement.

2. Pre-proposal

Not applicable.

B. Proposal

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 Help materials, accessible by navigating to https://pamspublic.science.energy.gov and clicking on the "PAMS Help" link.

Proposals submitted outside of PAMS will not be accepted.

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.

C. Component Pieces of the Proposal

1. Summary of Proposal Contents

Each DOE National Laboratory 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, and responsibilities of key project personnel)
    - Appendix 1: Biographical Sketch(es)
    - Appendix 2: Synergistic Activities (Optional)
    - 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)
- Collaborator Information

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. This must be a plain PDF file 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. The Project Narrative will be read by

SC staff using the full version of Adobe Acrobat: Please ensure that the narrative is readable in Acrobat. If combining multiple files into one Project Narrative, ensure that a PDF portfolio or binder is not created. If creating PDF files using any software other than Adobe Acrobat, please use a "Print to PDF" or equivalent process to ensure that all content is visible in the Project Narrative. Once a Project Narrative has been assembled, please submit the combined Project Narrative file through a "Print to PDF" or equivalent process to ensure that all content is visible in one PDF file that can be viewed in Adobe Acrobat.

> **WARNING**: The PAMS website at https://pampspublic.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.

LETTERS

Letters from collaborators or from institutions providing access to data, models, software, equipment and/or facilities may be appended to your Project Narrative and are not considered part of the Project Narrative's page limit. Please ensure that letters from collaborators or from institutions providing access to data, models, software, equipment and/or facilities only describe the nature of the collaboration or the access to data, models, software, equipment and/or facilities: Letters of support or recommendation are not allowed in proposals under this Announcement.

All letters may be addressed "To Whom It May Concern:".

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. The project summary/abstract must be comprised of

- The project title, the PI name and the PI's institutional affiliation, and any coinvestigators and their institutional affiliations. This information will not count toward the abstract's one-page limit.
- This information must be followed by a statement of the project's objectives, a description of the project, including methods to be employed, and the potential impact of the project (i.e., benefits, outcomes).
- The description of the proposed research may not exceed one page (excluding Project Title and list of investigators) when printed using standard letter-size (8.5-inch x 11-inch) paper with 1-inch margins (top, bottom, left, and right). The body text font must not be smaller than 11 point. Figures and references, if included, must fit within the one-page limit.

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 (no more than one page, excluding Project Title and list of investigators)

To attach a Project Summary/Abstract, click "Add Attachment."

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 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.

Provide a detailed budget for each thrust as part of the budget justification.

While subawards are listed in PAMS as "optional," that is because the presence of a subaward is optional. If a subaward exists, its budgetary information is required. The standard subaward budget form allows for a maximum of 10 subawards. If a proposal contains more than 10 subawards, please present the budgets for the eleventh and subsequent subawards in a tabular format, followed by the appropriate budget justification, as a part of the lead applicant's budget justification.

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 or Preproposal tracking number (if applicable):
- Research area or areas as identified in Section III of this Announcement (if applicable) :

Provide a supplementary page to the DOE title page, including:

1. List all research thrusts by name with each senior/key person (abbreviated SKP below) for the respective research on the same line.
2. Indicate the PI who will serve as the point of contact and coordinator for the combined application.
3. Include a table modeled on the following chart providing summary budget information for each research thrust. Provide the total costs (Direct and Indirect) in the budget request in each funding year as well as the totals for all rows and columns.
4. If necessary, appropriately add rows for additional senior/key persons and research thrust.
5. Applicants should appropriately modify the table below for the correct number of years where a budget is being requested in their proposal.

Proposal Budget Information by Thrust								
	Institution Name	**Research Thrust**	**Year 1 Budget ($)**	**Year 2 Budget ($)**	**Year 3 Budget ($)**	**Year 4 Budget ($)**	**Year 5 Budget ($)**	**Total Budget ($)**
Lead PI SKP #1 SKP #2								
Lead PI SKP #1 SKP #2								
TOTAL	---	---	***Total Year 1***	***Total Year 2***	***Total Year 3***	***Total Year 4***	***Total Year 5***	***Total Years 1-5***

Example Summary Budget Table (For Applications with Multiple Thrusts)

6. If any senior/key person requests support from two or more research thrusts, provide information on the estimated distribution of research effort (FTE) for them in a table (example below) in the thrust budget justification. Applicants should appropriately modify the table for their proposed efforts.

	Yearly FTE Estimates for Senior/Key Personnel with Multiple Thrusts						
Name	**Application Project Period**						
	Budget Period 1		**Budget Period 2**		…	**Budget Period 4**	
	Name of Thrust 1	Name of Thrust 2	Name of Thrust 1	Name of Thrust 2		Name of Thrust 1	Name of Thrust 2
	FTE	**FTE**	**FTE**	**FTE**		**FTE**	**FTE**
Senior/Key Person A	0	100%	25%	75%		50%	50%
Senior/Key Person B	50%	50%	25%	75%		0%	100%

Example Effort Table (for Applications with Multiple Thrusts)

The material listed here defines the minimum acceptable information on a title page. Additional information may be provided at the applicant's discretion.

PROJECT NARRATIVE

The Project Narrative **must not exceed a page limit of 18 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 body text font of all main text 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 IX for instructions on how to mark proprietary proposal information.

The Project Narrative comprises the research plan for the project. It should contain enough background material in the Introduction, including a brief review of the relevant literature and any prior research in this area, 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 methods 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.

The following organization of the Project Narrative is suggested:

- **Portfolio Vision and Background/Introduction**: Overarching explanation of the vision, importance, and relevance of the proposed research portfolio for the DOE mission.
- **For each research Thrust**:
    - **Background/Introduction**: Explanation of the importance and relevance of the proposed work as well as a review of the relevant literature.
    - **Objectives:** This section should provide a clear, concise statement of the specific objectives/aims of the proposed research.
    - **Proposed Research and Methods**: Identify the hypotheses to be tested (if any) and details of the methods to be used.
- **Integration Tasks**: Articulate the individual role of each research Thrust as a key enabling technology in scientific computing, along with its potential integration with other research Thrusts and DOE plans or priorities.
- **Management Plan and Milestones**: Proposals must include a management plan that clearly indicates how the research will be directed and adapted to achieve the objectives described Section III. The plan must specifically address any proposed teaming arrangements, including by clearly articulating roles, responsibilities, and decision-making structures and principles. A significant component of the proposal is the portfolio vision and management plan to maximize the timeliness and long-term impact of ASCR and DOE investments in scientific computing. The proposal must provide milestones for each research Thrust and each integration Task for alignment with the portfolio vision. Note the specific questions associated with the management plan in Section IV.B.4.

The Project Narrative is considered the intellectual work of the proposed researchers. Concurrent submission of the same or substantially similar narratives attributed to different researchers may constitute academic dishonesty or research misconduct. Submission of a Project Narrative that is not the work of the proposed researchers, including machine-generated Project Narratives, may constitute academic dishonesty or research misconduct.

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.

Detailed instructions may be found in Section IX 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 malign foreign talent recruitment programs must be identified in current and pending support.

APPENDIX 2: SYNERGISTIC ACTIVITIES (OPTIONAL)

In addition to biographical sketches in the Common Format, each senior/key person may provide a one-page list of no more than five distinct examples of synergistic activities that demonstrate the individual's professional and scholarly activities that focus on the integration, transfer, and creation of knowledge as related to the proposal.

- Provide the syngergistic activities as an appendix to your Project Narrative.
- Do not attach a separate file.
- The synergistic activities appendix will not count in the Project Narrative page limitation.

APPENDIX 3: 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 a proposal to other organizations for simultaneous consideration will not prejudice its review.

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

Detailed instructions may be found in Section IX of this Announcement.

APPENDIX 4: BIBLIOGRAPHY & REFERENCES CITED

Provide a bibliography of any references cited in the Project Narrative. Each reference must include the names of all authors (in the same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers, and year of publication. For research areas where there are routinely more than ten coauthors of archival publications, you may use an abbreviated style such as the *Physical Review Letters* (PRL) convention for citations (listing only the first author). For example, your paper may be listed as, "A Really Important New Result," A. Aardvark et. al. (MONGO Collaboration), PRL 999. Include only bibliographic citations. Applicants should be especially careful to follow scholarly practices in providing citations for source materials relied upon when preparing any section of the proposal. Provide the Bibliography and References Cited information as an appendix to your Project Narrative.

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

APPENDIX 5: 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 6: 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 7: DATA MANAGEMENT PLAN

Provide a Data Management Plan (DMP) as an appendix to the Project Narrative.

- This appendix should not exceed a page limit of four 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 IX of this Announcement.

In addition, the DMP must specifically address:

- How FAIR (Findable, Accessible, Interoperable, and Reusable)[6] principles will apply to the

[6] Wilkinson, M. D. et al. The FAIR Guiding Principles for Scientific Data Management and Stewardship. Sci. Data 3:160018, 2016. https://doi.org/10.1038/sdata.2016.18

anticipated data sets, software[7], and models[8] to be developed.

- What developed software, data sets, and models will be made available using an "opensource" licensing arrangement, noting the Software Package Data Exchange (SPDX) identifier(s) (https://spdx.org/licenses/) when possible, and where deviation in this arrangement is expected from The Open Source Initiative's "Open Source Definition" (https://opensource.org/osd), a specific justification must be provided.
- How best practices in scientific software development will be applied to any development activities. For more information on best practices, see Better Scientific Software (https://bssw.io/).

APPENDIX8: 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.

5. Collaborator Information

Provide a listing of senior/key personnel at the applicant institution and any proposed subawards and a listing of individuals who should not serve as merit reviewers. You may also indicate suggested merit reviewers. Detailed instructions for these listings may be found in Section IX of this Announcement.

[7] Chue Hong, N. P., Katz, D. S., Barker, M., Lamprecht, A-L, Martinez, C., Psomopoulos, F. E., Harrow, J., Castro, L. J., Gruenpeter, M., Martinez, P. A., Honeyman, T., et al. (2022). FAIR Principles for Research Software version 1.0. (FAIR4RS Principles v1.0). Research Data Alliance. DOI: https://doi.org/10.15497/RDA00068

[8] Ravi, N., Chaturvedi, P., Huerta, E.A. et al. FAIR principles for AI models with a practical application for accelerated high energy diffraction microscopy. Sci Data 9, 657 (2022). https://doi.org/10.1038/s41597-022-01712-9

V. Submission Requirements and Deadlines

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 Help materials, accessible by navigating to https://pamspublic.science.energy.gov and clicking on the "PAMS Help" link.

Proposals submitted outside of PAMS will not be accepted.

B. Submission Instructions

Letters of Intent (LOIs),and/or proposals must be submitted in PAMS at https://pamspublic.science.energy.gov. Detailed instructions for LOIs are in Section IX of this Announcement. Detailed instructions for pre-proposals are in Section IX of this Announcement. Detailed instructions for proposals are in Section IX of this Announcement.

D. 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 LOI well before the deadline. LOIs may be submitted at any time between the publication of this Announcement and the stated deadline.

2. Pre-proposal Due Date

Not applicable.

3. Proposal Due Date

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

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

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

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

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

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

VI. Proposal Review Information

A. Responsiveness Review

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.

B. Review Criteria

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

1. Scientific and/or Technical Merit of the Project

- What is the scientific innovation of the proposed research?
- What is the likelihood of achieving valuable results?
- How might the results of the proposed work impact the direction, progress, and thinking in relevant scientific fields of research?
- How does the proposed work compare with other efforts in its field, both in terms of scientific and/or technical merit and originality?
- Does the proposal specify at least one scientific hypothesis motivating the proposed work in each thrust? Is the investigation of the specified hypothesis or hypotheses scientifically valuable?
- Is the Data Management Plan suitable for the proposed research? To what extent does it support the validation of research results? To what extent will research products, including data, be made available and reusable to advance the field of research?
- Does the Data Management Plan address the specific requirements the topic description?

2. Appropriateness of the Proposed Method or Approach

- Does the proposed research employ innovative concepts or methods?
  How logical and feasible are the research approaches?
- Can the approach proposed concretely contribute to our understanding of the validity of the specified scientific hypothesis or hypotheses in each thrust?
- Are the conceptual framework, methods, and analyses well justified, adequately developed, and likely to lead to scientifically valid conclusions?
- Does the applicant recognize significant potential problems and consider alternative strategies?
- Is the proposed research aligned with the published priorities identified or incorporated by reference in Section III of this Announcement?

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

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

4. Strength of the Management Plan

- How effectively has the applicant presented a comprehensive management plan with a leadership structure with clear roles and responsibilities?
- How appropriate, substantive, and well-defined are the roles for each team member?
- How well does the organizational structure align with the proposed research efforts?
- How does the management plan address research evaluation, adding or modifying research partners and projects, succession planning, sunsetting unproductive or completed research, and the handling of research misconduct?

5. Reasonableness and Appropriateness of the Proposed Budget

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

C. 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.

ASCR anticipates holding a merit review panel of experts to evaluate proposals submitted to this Announcement.

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
- Ensuring a distribution of supported researchers at various career stages
- Providing career pathways for the next generation of researchers
- Maximizing the use of DOE user facilities
- Ensuring opportunities to investigators not currently supported by DOE

- Commitment to sharing the results of research

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.

VII. Award Notices

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. Anticipated Timeline for Notice of Selection for Award Negotiation

It is anticipated that the award selection will be completed by 9/1/2025. It is expected that awards will be made in Fiscal Year 2025.

1. Notice of Selection for Award Negotiation

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.

VIII. Post-Award Requirements and Administration

A. Administrative and Policy Requirements

Additional administrative and policy provisions applicable to this Announcement are included in the list below. The full text of each provision is in Section IX of this Announcement and may be accessed by navigating to the hyperlinks below:

1. Availability of Funds
2. Commitment of Public Funds
3. Digital Persistent Identifier (PID)
4. Environmental, Safety and Health (ES&H) Performance of Work at DOE Facilities
5. Evaluation and Administration by Non-Federal Personnel
6. Federal, State, and Local Requirements
7. Funding Restrictions
8. Government Right to Reject or Negotiate
9. Modification
10. PDF Generation
11. Proprietary Proposal Information
12. Publications
13. Updating Your PAMS Profile

B. Reporting

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

IX. Other Information

A. Checklist for Avoiding Common Errors

Note that not all items in this checklist will apply to every submission under every Announcement.

Checklist for Avoiding Common Errors:

Item	Issue
Proposals	Submitted in PAMS. Do not submit proposals in Grants.gov or FedConnect. Do not attempt to submit a proposal unless you are affiliated with a DOE/NNSA National Laboratory.
Letters of Intent (LOIs)	- Submit your LOI in PAMS. - Do not submit your LOI in Grants.gov. - Follow the instructions in Section IV for the preparation of an LOI.
Page Limits	Strictly followed throughout proposal, including particular attention to: - Project Narrative - Data Management Plan(s) (DMPs) - Letter(s) of Recommendation, if any
Personally Identifiable Information	None present in the proposal
Project 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.
Current and Pending Support	Ensure complete listing of all activities, regardless of source of funding.
List of Individuals who Should not Serve as Merit Reviews	Provided as separate file in proposal
Data Management Plans (DMP)	- If referring to an experiment's DMP, describe the relationship to the proposed research - Include a DMP even if no experimental data is expected

Promoting Inclusive and Equitable Research (PIER) Plan	PIER Plans are a new requirement for new and renewal proposals.
Institutions capable of being funded through the DOE Field Work System	Do not create new institutions in the PAMS website for any DOE/NNSA National Laboratory or DOE Site. Submissions will be evaluated for technical merit, but any resulting funding, work, or awards will be made under the laboratory or site's contract with DOE. No separate financial assistance awards will be made. No administrative provisions of this Announcement will apply to the laboratory or any laboratory subcontractor.

B. How-To Guides

The how-to guides provided in this section are intended as general guidance about SC. Not all parts will be applicable to every Announcement, every proproal, or every institution.

1. How to Distinguish Between a New and Renewal Proposal

New Proposal: A proposal must be submitted as "new" in the following circumstances:

- When applying for funding to create a new research award that has not previously received DOE funding, including any funding for the current year,
- When applying for funding to support continued research from the same applicant institution as the current grant but with a significant change in fundamental nature of the research, or
- When applying for funding to support continued research supported by an existing DOE award but at a new applicant institution.

Renewal Proposal: A renewal proposal is appropriate when funds are requested for an award from the same recipient/applicant institution that has no significant changes in the following items:

- The award's senior leadership, and
- The fundamental nature of the award.

A change in an award's PI does not necessarily require submission as a new proposal: The change in personnel must be considered in light of other changes.

Renewal proposals compete for funds with all other peer-reviewed proposals and must be developed as fully as though the applicant were applying for the first time. Renewal proposals must be submitted by the same sponsoring institution as that holding the current award for which renewal funding is requested, and the proposed research topic must be logical scientific extensions of the research that has been performed in the current award.

2. How Consortia May be Used

INCORPORATED CONSORTIA

Incorporated consortia are eligible to apply for funding as a prime recipient (lead organization) or subrecipient (team member).

Each incorporated consortium must have an internal governance structure and a written set of internal rules. Upon request, the consortium must provide a written description of its internal governance structure and its internal rules to the DOE contracting officer. There is no requirement that subawards be formalized into incorporated consortia.

UNINCORPORATED CONSORTIA

Unincorporated consortia (team arrangements) 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 proposal and results in one award with subawards to consortia members. Multi-institutional teams may, if permitted under this Announcement, submit collaborative proposals with each institution submitting its own proposal with an identical Project Narrative, resulting in multiple awards to the collaborating institutions.

3. 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.**

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.

4. 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-proposal. All PIs and

those submitting pre-proposals on behalf of PIs are encouraged to establish PAMS accounts as soon as possible to avoid submission delays.

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-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.

5. 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 PAMS Help materials, accessible by clicking the "PAMS Help" 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 proposal:

- 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 proposal 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 proposals. Such resubmissions will only count as one submission if this Announcement restricts the number of proposals 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.

6. How to Prepare a Biographical Sketch

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 Vitae (SciENcv), a cooperative venture maintained at https://www.ncbi.nlm.nih.gov/sciencv/. The fillable PDFs provided by the National Science Foundation are no longer available. SciENcv has been updated to meet the interagency common format biographical sketches.

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 professional/academic positions in chronological order with a brief description. List all current academic, professional or institutional appointments, foreign or domestic, at the applicant institution or elsewhere, whether remuneration is received, and, whether full-time, part-time, or voluntary.
- **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.

Do not attach a listing of individuals who should not be used as merit reviewers: This information is no longer collected as part of a biographical sketch.

SC strongly recommends the use of SciENcv to reduce administrative burden by allowing the use of digital persistent identifiers, including the Open Researcher and Contributer ID (ORCiD). If not using SciENcv, append the following signed and dated certification to a biographical sketch:

> I, [Full Name and Title], certify to the best of my knowledge and belief that the information contained in this Current and Pending Support Disclosure Statement is true, complete, and accurate. I understand that any false, fictitious, or fraudulent information, misrepresentations, half-truths, or omissions of any material fact, may subject me to criminal, civil or administrative penalties for fraud, false statements, false claims or otherwise. (18 U.S.C. §§ 1001 and 287, and 31 U.S.C. 3729-3733 and 3801-3812). I further understand and agree that (1) the statements and representations made herein are material to DOE's funding decision, and (2) I have a responsibility to update the disclosures during the period of performance of the award should circumstances change which impact the responses provided above.

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.

7. 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 Section A of the proposal 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 Section A of the proposal 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. If using the template:

- Do not add tabs to the spreadsheet
- Do not merge the existing tabs
- Do not remove headers
- Fill out the requested headers on both tabs with the same information
- Ensure that given and family names are presented in the correct columns

8. 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. Include the current application and any application submitted to any source of funding in a list of current and pending support. All sources of support must be disclosed, but for work that is subject to government classification or enforceable non-disclosure agreements, the general area of the research should be described without disclosing sensitive details and the sponsor should be listed as "Government Agency" or "private sponsor." 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 Vitae (SciENcv), a cooperative venture maintained at https://www.ncbi.nlm.nih.gov/sciencv/. The fillable PDFs provided by the National Science Foundation are no longer available. SciENcv has been updated to meet the interagency common format for current and pending support.

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. If the title of the award or activity is not descriptive, add a brief description of the research being performed that would identify any overlaps or synergies with the proposed research.
- 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.

If required to identify overlap, duplication of effort, or synergistic efforts, append a description of the other award or activity to the current and pending support.

SC strongly recommends the use of SciENcv to reduce administrative burden by allowing the use of digital persistent identifiers, including the Open Researcher and Contributer ID (ORCiD). If not using SciENcv, append the following signed and dated certification to current and pending support:

> I, [Full Name and Title], certify to the best of my knowledge and belief that the information contained in this Current and Pending Support Disclosure Statement is true, complete, and accurate. I understand that any false, fictitious, or fraudulent information, misrepresentations, half-truths, or omissions of any material fact, may subject me to criminal, civil or administrative penalties for fraud, false statements, false claims or

otherwise. (18 U.S.C. §§ 1001 and 287, and 31 U.S.C. 3729-3733 and 3801-3812). I further understand and agree that (1) the statements and representations made herein are material to DOE's funding decision, and (2) I have a responsibility to update the disclosures during the period of performance of the award should circumstances change which impact the responses provided above.

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.

9. 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

10. 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.

Please provide the total funding requested across all budget fields to support the implementation of the project PIER Plan.

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 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.
Section E Participant/Trainee Support Costs	If applicable, submit training support costs. Educational projects that intend to support trainees (precollege, college, graduate and post graduate) must list each trainee cost that includes stipend levels and amounts, cost of tuition for each trainee, cost of any travel (provide the same information as needed under the regular travel category), and costs for any related training expenses. Participant costs are those costs associated with conferences, workshops, symposia or institutes and breakout items should indicate the number of participants, cost for each participant, purpose of the conference, dates and places of meetings and any related administrative expenses. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis).
Section F Other Direct Costs	• **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 cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). • **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.

11. How to Register in PAMS

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

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 a proposal, you may already be linked to an institution in PAMS. If this happens, you will be taken to the PAMS home page.)

REGISTER TO YOUR INSTITUTION:

1. 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.)
2. PAMS will take you to the "Register to Institution" page.
3. 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.)
4. 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.
5. 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.
6. 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 "PAMS Help" 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.

12. 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."

C. Administrative and Policy Requirements

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. Digital Persistent Identifier (PID)

Covered individuals[9] listed on proposals must provide a digital persistent identifier (PID) in the common Biographical Sketch and Current and Pending (Other) Support forms as part of the proposal. Included PIDs must meet the common/core standards specified in the NSPM-33 Implementation Guidance or successor guidance (e.g., an ORCID iD). The inclusion of an individual's PID will be optional until May 1, 2025, and mandatory thereafter.

[9] Covered Individual has the same meaning as in the Research Security Training Requirement provision.

4. 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.

5. 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.

6. 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.

7. 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.

8. 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.

9. 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/).

10. PDF Generation

The Project Narrative in a proposal must be one single machine-readable PDF file that contains

the DOE Title Page, Project Narrative, all required appendices, and other attachments. This single PDF file may not be scanned from a printed document and must be uploaded in PAMS. This must be a plain PDF file consisting of text, numbers, and images without editable fields, signatures, passwords, redactions, or other advanced features available in some PDF-compatible software. The Project Narrative will be read by SC staff using the full version of Adobe Acrobat: Please ensure that the narrative is readable in Acrobat. If combining multiple files into one Project Narrative, ensure that a PDF portfolio or binder is not created. If creating PDF files using any software other than Adobe Acrobat, please use a "Print to PDF" or equivalent process to ensure that all content is visible in the Project Narrative. Once a Project Narrative has been assembled, please submit the combined Project Narrative file through a "Print to PDF" or equivalent process to ensure that all content is visible in one PDF file that can be viewed in Adobe Acrobat. Review your submission to ensure that blank pages are not present.

11. Proprietary Proposal Information

Department of Energy (DOE) takes very seriously the confidentiality of all applicants and will treat information submitted in proproals, as well as the identity of applicants, as confidential to the fullest extent permissible under Federal law. In order for DOE to protect confidential information, the applicant must also treat the information as confidential and properly mark it as described below. DOE will not be able to protect information that the applicant has released publicly or is in the public domain. For additional information on DOE's Freedom of Information Act (FOIA) regulations, see 10 CFR 1004.

Applicants should not include business sensitive information (e.g., commercial or financial information that is privileged or confidential), trade secrets, proprietary, or otherwise confidential information in their proposal unless such information is necessary to convey an understanding of the proposed project or to comply with a requirement in the Announcement. Applicants are advised to not include any critically sensitive proprietary detail.

If a proposal includes trade secrets or information that is commercial or financial, or information that is confidential or privileged, it is furnished to the Government in confidence with the understanding that the information shall be used or disclosed only for evaluation of the proposal. Such information will be withheld from public disclosure to the extent permitted by law, including the FOIA. Without assuming any liability for inadvertent disclosure, DOE will seek to limit disclosure of such information to its employees and to outside reviewers when necessary for merit review of the proposal or as otherwise authorized by law. This restriction does not limit the Government's right to use the information if it is obtained from another source.

Proposals and other submissions containing confidential, proprietary, or privileged information must be marked as described below. Failure to comply with these marking requirements may result in the disclosure of the unmarked information under the FOIA or otherwise. The U.S. Government is not liable for the disclosure or use of unmarked information and may use or disclose such information for any purpose.

The cover sheet of the Proposal and other submission must be marked as follows and identify the specific pages containing trade secrets, confidential, proprietary, or privileged information:

Notice of Restriction on Disclosure and Use of Data:
Pages [list applicable pages] of this document may contain trade secrets, confidential, proprietary, or privileged information that is exempt from public disclosure. Such information shall be used or disclosed only for evaluation purposes or in accordance with a financial assistance or loan agreement between the submitter and the Government. The Government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source. [End of Notice]

The header and footer of every page that contains confidential, proprietary, or privileged information must be marked as follows: "Contains Trade Secrets, Confidential, Proprietary, or Privileged Information Exempt from Public Disclosure." In addition, each line or paragraph containing proprietary, privileged, or trade secret information must be clearly marked with double brackets or highlighting.

IMPORTANT GUIDANCE FOR COMPANY SUBMITTERS:

As per DOE's FOIA regulations and Department of Justice FOIA guidance, if DOE receives a FOIA request the following general steps will be taken:

1. DOE will review the request to determine whether your company's information is subject to the request. Only federal records are subject to FOIA requests. Depending on the circumstances, information submitted by an outside entity may be considered "federal records" for purposes of FOIA.
2. If your company information is determined to be a federal record and responsive to a FOIA request, DOE will review what was submitted in order to determine if DOE can make a determination whether the information is legally exempt.
    a. If DOE determines your information is fully exempt under an exemption and that it will not be released, DOE may not contact you.
    b. If DOE is unable to determine whether the information is exempt under an exemption or is planning on releasing some or all of your information, DOE will first contact you in order for you to have an opportunity to respond and provide additional justification as to why it may be exempt. DOE will do all that it can to work with company submitters to be in compliance with the law and maintain positive relations with company submitters.
    c. It is critical if DOE or DOE's contractors who are processing your FOIA contact you that you respond in a timely manner. DOE is under strict deadlines when processing a FOIA request.

12. 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/. 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 Laboratory's contract.

13. 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 personnel at applicant and awardee institutions, including Principal Investigators (PIs), Co-PIs, and other Key Personnel, to provide their demographic information. 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 award selections from a particular SC Announcement may be reviewed by a Committee of Visitors.