

**DEPARTMENT OF ENERGY
OFFICE OF SCIENCE**



MICROELECTRONICS CO-DESIGN RESEARCH

**DOE NATIONAL LABORATORY PROGRAM ANNOUNCEMENT NUMBER:
LAB 21-2491**

ANNOUNCEMENT TYPE: INITIAL

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Submission Deadline for Letter of Intent:	April 21, 2021 at 5:00 PM Eastern Time A Letter of Intent is required
Submission Deadline for Proposals:	May 19, 2021 at 5:00 PM Eastern Time

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UPDATES AND REMINDERS

RECOMMENDATION

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

CURRENT AND PENDING SUPPORT AND BIOSKETCHES

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

DATA MANAGEMENT PLAN

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

UNIQUE ENTITY IDENTIFIER (UEI)

The Federal Government is transitioning from the Data Universal Numbering System (DUNS), assigned by Dun and Bradstreet at <https://fedgov.dnb.gov> to the UEI, assigned by the System for Award Management at <https://www.sam.gov>. Information systems including SAM.gov and PAMS (<https://pamspublic.science.energy.gov>) are being updated. Please follow the on-screen instructions or contact each system's Help Desk for additional information.

ACKNOWLEDGMENT OF FEDERAL SUPPORT

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

PUBLIC ACCESS

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

Checklist for Avoiding Common Errors:

Item	Issue
Page Limits	Strictly followed throughout proposal, including particular attention to: <ul style="list-style-type: none"> - Research Narrative - Narrative Appendices, if any - Biosketches - Data Management Plan(s) (DMPs)
Personally Identifiable Information	None present in the proposal
Research Narrative	Composed of one PDF file including all appendices
Project Summary / Abstract	Name(s) of applicant, PI(s), PI's institutional affiliation(s), Co-Investigator(s), Co-Investigator's institutional affiliation(s)
DOE Title Page	Follow instructions closely
Budget	Use current negotiated indirect cost and fringe benefit rates
Budget Justification (attached to budget)	Justify all requested costs
Biographical Sketches	Follow page limits strictly
Current and Pending Support	Ensure complete listing of all activities including brief abstract of scope of work for all items listed, regardless of the source of support
Data Management Plans (DMP)	<ul style="list-style-type: none"> - If referring to an experiment's DMP, describe the relationship to the proposed research - Include a DMP even if no experimental data is expected

Section I – DOE NATIONAL LABORATORY OPPORTUNITY DESCRIPTION

ALL INQUIRIES ABOUT THIS ANNOUNCEMENT SHOULD BE DIRECTED TO:

Microelectronics@science.doe.gov

SUMMARY

The DOE SC programs in Advanced Scientific Computing Research (ASCR), Basic Energy Sciences (BES), Fusion Energy Sciences (FES), High Energy Physics (HEP), and Nuclear Physics (NP) hereby announce their interest in multi-investigator, multi-disciplinary proposals for basic research to enable transformative innovation in microelectronic technologies for computing, communication, sensing, and power. For decades, SC has been at the leading edge of microelectronics, both as a consumer and as an engine of scientific understanding that has enabled many of the technological breakthroughs adopted by industry. Today, the end of Moore’s Law, along with the emergence of new computing and sensing workloads and rapidly expanding data, have resulted in an unprecedented need and opportunity to “redesign” the innovation process. In this funding opportunity announcement the terms “microelectronics” and/or “semiconductor” are used broadly to refer to semiconductors and related materials, processing chemistries, design, fabrication, lithography, packaging, sensors, devices, integrated circuits, processors, computing architectures, modeling and simulation, software tools, and related technologies.

SUPPLEMENTARY INFORMATION

Background

SC is the nation’s largest supporter of basic research in the physical sciences, the steward of 10 of the Nation’s national laboratories, and the lead federal agency supporting fundamental research for energy production and security. SC accelerates discovery with the world’s largest array of major scientific user facilities that includes particle accelerators and colliders, powerful X-ray light sources, and nanoscience centers. Some of the most complex sensors, detectors, and supercomputers in the world reside in DOE user facilities and enable technological innovation while speeding insights into everything from the properties of materials, plasma in fusion reactors, to complex weather and climate patterns, to the geophysics of earthquakes. Discovery and use-inspired science supported by SC provides an enduring foundation for technological innovation and economic progress.

The following five SC programs are participating in this funding opportunity:

Advanced Scientific Computing Research (ASCR): The ASCR program’s mission is to advance applied mathematics and computer science; deliver the most sophisticated computational scientific applications in partnership with disciplinary science; advance computing and networking capabilities; and develop future generations of computing hardware and software tools for science and engineering in partnership with the research

community, including U.S. industry. ASCR supports state-of-the-art capabilities that enable scientific discovery through computation and networking.

Basic Energy Sciences (BES): BES supports fundamental research to understand, predict, and ultimately control matter and energy at the electronic, atomic, and molecular levels in order to provide the foundations for new energy technologies and to support DOE missions in energy, environment, and national security. BES research is supported through two Divisions, both of which have interest in science relevant to microelectronics: The Chemical Sciences, Geosciences, and Biosciences (CSGB) Division and the Materials Sciences and Engineering (MSE) Division.

Fusion Energy Sciences (FES): The mission of the Fusion Energy Sciences (FES) program is to expand the fundamental understanding of matter at very high temperatures and densities and to build the scientific foundation needed to develop a fusion energy source. This is accomplished through the study of plasma, the fourth state of matter, and how it interacts with its surroundings. One of the strategic goals of the FES program is to increase the fundamental understanding of basic plasma science, including both burning plasma and low temperature plasma (LTP) science and engineering, to enhance economic competitiveness and to create opportunities for a broader range of science-based applications.

High Energy Physics (HEP): The HEP program's mission is to understand how the universe works at its most fundamental level by discovering the elementary constituents of matter and energy, probing the interactions between them, and exploring the basic nature of space and time.

Nuclear Physics (NP): The NP program's mission is to discover, explore, and understand all forms of nuclear matter. Nuclear physicists seek to understand not just the familiar forms of matter we see around us, but also exotic forms such as those that existed in the first moments after the Big Bang and that exist today inside neutron stars. The aim is to understand why matter takes on the specific forms now observed in nature and how that knowledge can benefit society in the areas of commerce, medicine, and national security.

In 2018 SC held a workshop entitled **Basic Research Needs (BRN) for Microelectronics**. The full technical report from this workshop is available here:

https://science.osti.gov/-/media/bes/pdf/reports/2019/BRN_Microelectronics_rpt.pdf

The workshop identified the need to move away from the historical sequential R&D process to a co-design framework where each scientific discipline informs and engages the others, with multi-directional information flow. The workshop report described five priority research directions: 1) Flip the current paradigm: Define innovative material, device, and architecture requirements driven by applications, algorithms, and software; 2) Revolutionize memory and data storage; 3) Reimagine information flow unconstrained by interconnects; 4) Redefine computing by leveraging unexploited physical phenomena; and 5) Reinvent the electricity grid through new materials, devices, and architectures. In addition, the report identified the need for a

dramatic shift toward a co-design approach, where each discipline informs and engages others to achieve transformative advances in system-level performance. **Applicants are strongly encouraged to align proposals with the priority research directions and co-design approach articulated in this report.**

In addition, the following reports, listed alphabetically, may also be informative in the development of proposals (responding directly to these reports is not a requirement of this funding opportunity):

5G Enabled Energy Innovation Workshop

https://science.osti.gov/-/media/ascr/pdf/programdocuments/docs/2020/5G_Workshop_Report_2020.pdf

Basic Research Needs for Innovation and Discovery of Transformative Experimental Tools

https://science.osti.gov/-/media/bes/pdf/reports/2017/BRNIDTET_rpt_print.pdf

Basic Research Needs for Synthesis Science for Energy Technologies

https://science.osti.gov/-/media/bes/pdf/reports/2017/BRN_SS_Rpt_web.pdf

Basic Research Needs for Transformative Manufacturing

https://science.osti.gov/-/media/bes/pdf/reports/2020/Transformative_Mfg_Brochure.pdf

Basic Research Needs Study on High Energy Physics Detector Research & Development

https://science.osti.gov/-/media/hep/pdf/Reports/2020/DOE_Basic_Research_Needs_Study_on_High_Energy_Physics.pdf

Decadal Plan for Semiconductors

<https://www.src.org/about/decadal-plan/>

Electron-Ion Collider Detector Requirements and R&D Handbook

http://www.eicug.org/web/sites/default/files/EIC_HANDBOOK_v1.2.pdf

The Future of Scientific Workflows

https://science.osti.gov/-/media/ascr/pdf/programdocuments/docs/workflows_final_report.pdf

The 2015 Neuro-Inspired Computational Elements Workshop

https://science.osti.gov/-/media/ascr/pdf/programdocuments/docs/NICE2015_Workshop_Report.pdf

Neuromorphic Computing – Architectures, Models, and Applications Workshop

https://science.osti.gov/-/media/ascr/pdf/programdocuments/docs/Post-Workshop_Report_2016_Neuromorphic_Computing.pdf

Neuromorphic Computing – From Materials Research to Systems Architecture Roundtable

https://science.osti.gov/-/media/bes/pdf/reports/2016/Neuromorphic_Computing_rpt.pdf

Plasma Science: Enabling Technology, Sustainability, Security, and Exploration
<https://www.nap.edu/read/25802/chapter/1>

Powering the Future Fusion & Plasmas - A Report of the Fusion Energy Sciences Advisory Committee
https://science.osti.gov/-/media/fes/fesac/pdf/2020/202012/FESAC_Report_2020_Powering_the_Future.pdf

Research Scope

To enable continued advances in sensing, computing, communication, networking, and power technologies, a fundamental rethinking is needed of the science behind the materials and chemistry, synthesis and fabrication, device physics, architectures, energy efficiency, algorithms, software, and modeling/simulation. SC is poised at the convergence of these diverse research areas, in a unique position to play a critical role in the advancement of microelectronic technologies over the coming decades, and also to benefit from the resultant capabilities for advancing fundamental scientific research. To support and foster this paradigm shift, this funding opportunity is requesting proposals for fundamental scientific research in the following three

Research Areas:

- ***New materials, chemistry, synthesis, and fabrication***
- ***New computing paradigms and architectures***
- ***Integrated sensing, edge computing, and communication***

Each Letter of Intent and Proposal in response to this funding opportunity must propose research that is integrated across at least two of these areas.

Detailed descriptions of each area follow:

- ***New materials, chemistry, synthesis, and fabrication***

Experimental, theoretical, and computational research to provide a fundamental understanding of chemical transformations and energy flow serves as a basis for the development of new processes for microelectronics by enabling the realization of innovative materials, devices, and architectures, through new concepts for data storage and memory, and through new architectures, such as 3D assemblies, as well as flexible soft interfaces. Similarly, the discovery and design of new materials with novel structures, functions, and properties serves as a basis for the development of new computing, communications, and sensing technologies based on unexploited physical phenomena. Proposed research must focus on establishing the science foundation for transformative changes in the way we detect, analyze, communicate, and store information, rather than on incremental improvements to current technologies. Highly energy efficient systems and processes should also be envisioned by all research projects.

This funding opportunity seeks proposals that use intermolecular interactions to control electronic states or electron flow, resulting in fundamental consequences such as: (i) molecular recognition as a basis for patterning structures with innovative molecular synthesis; (ii) short-range interactions for electronic transport pathways over controllable distances; (iii) synthesis of molecules that provide stationary electronic states for memory; and (iv) approaches that are inspired by the way that biological systems control electron transfer, sense and respond to environmental conditions, and deal with excess energy in ways that could lead to new, robust processes to perform computation. The funding opportunity also seeks proposals that explore and control novel materials systems and physical properties that could be exploited to enable future logic, memory, sensing, and communications devices and systems. In particular, research focused on the discovery, synthesis, characterization, and control of a broad range of electronic and magnetic materials including (but not limited to) semiconductors, superconductors, ferroelectrics, multiferroics, and topological materials are encouraged. While studies of bulk three-dimensional (3D) materials may be supported, particular emphasis will be placed on 1D, 2D, and nanostructured materials that have the potential to be integrated into future nanofabricated devices and systems.

Research on the science underpinning synthesis and fabrication is encouraged, including new techniques to synthesize materials and molecules with desired structure, properties, and function. This includes, but is not limited to, synthesis of complex thin films and nanoscale materials with atomic layer-by-layer control; understanding the contributions of the liquid and other precursor states to the processing of bulk nanoscale materials; low energy processing techniques for large scale nanostructured materials; and innovative synthetic approaches to enable scalable assembly of matter. This funding opportunity also invites research proposals in low temperature plasma (LTP) science, emphasizing synthesis of new materials as well as atomic-layer etching and deposition of materials for plasma-enabled fabrication of microelectronics. LTPs are a unique state of partially ionized matter composed of ions, electrons, atoms, molecules, and reactive and excited species. Energetic electrons colliding with molecules can produce a non-equilibrium chemically reactive environment in gases and on surfaces at near ambient temperatures. Research responsive to this funding opportunity must focus on how electrical energy is selectively and efficiently converted into chemical reactivity, and on transporting that reactivity to the interface between LTPs and complex materials including next generation semiconductor materials. Areas of interest include but are not limited to: Fundamental processes in controlling LTPs for producing reactive species for microelectronics processing; Controlling LTP-surface interactions at the atomic level to create the next generation of materials for quantum computing; High-fidelity computation and numerical simulation of the LTP in a reactor of the type used for etching and deposition for microelectronics fabrication; Controlling the interaction of LTP with a single layer of atoms to manufacture integrated circuits; and LTP processing of material surfaces and thin films to enable industrial scale fabrication of microelectronics.

- ***New computing paradigms and architectures***

Over the past three decades, the evolution of microelectronics technologies has enabled DOE to design and deploy, in partnership with U.S. industry, some of the world's most powerful high-performance computing and networking capabilities to meet its energy, national security and science missions. New research and development opportunities in microelectronics are needed to enable breakthroughs beyond current state-of-the-art computing technologies. To enable new generations of energy-efficient computing systems over the next decade, a complete reconceptualization of the science and technology underlying the microelectronics co-design approach is needed to integrate emerging devices, materials, interconnects, and non-linear phenomena with the needs of scientific computing applications. This funding opportunity solicits the development of new modeling and simulation software tools that incorporate artificial intelligence and machine learning technologies to accelerate the exploration and development of emerging hardware approaches that may advance a range of new computing technologies including identifying new approaches to address the movement of data between processors and between nodes, high performance computing, edge computing, bio-inspired or neuromorphic computing, and advanced wireless (5G, Wifi6, 6G+, etc) for scientific applications.

Neuromorphic computing promises to achieve over one million times improvement in energy efficiency compared to current state of the art in computing and could significantly accelerate artificial intelligence and machine learning approaches. In addition, it could be leveraged to enhance a wide range of applications such as embedded, edge computing, networking, analysis, and high-performance computing accelerators. This area of research requires effective collaboration between various scientific disciplines from materials science, devices, microelectronics, engineering, computer science, high performance computing, to neuroscience, all of which are required to make neuromorphic computing a reality. The ultimate goal is to develop an energy efficient computing architecture capable of autonomous operation, learning, self-diagnosis and -repair.

- ***Integrated sensing, edge computing, and communication***

Today's experimental, observational, and computational sciences involve dynamically integrated and interactive collaborations. Often, the science is conducted as a workflow of many related tasks. Scientific instruments could be static, mobile, remote, and/or distributed, and could benefit from being able to connect and interact with established networking, storage, cloud, or high-performance computing facilities. Data may be generated by sensor systems, edge computing devices, or a combination of various data sources and models.

Most instruments employ advanced sensors and tightly integrated, application-specific front-end electronics (FEE) and trigger and data acquisition electronics that require cutting-edge microelectronics technologies. Often, these instruments include

microelectronics that must function in extreme radiation or temperature environments and consume very little power.

Sensors with exquisite efficiency and energy or spatial resolution are needed for charged particle and radiation detection over a wide range of energies and wavelengths. To date, silicon is the most widely used sensor material, with many fabrication processes provided by the semiconductor industry. Improved or new sensor materials are needed (e.g., large-bandgap semi-conductors, diamond, thin film materials, 2D materials, superconductor materials, etc.) to enhance performance across a broad range of applications, and processes need to be developed, in collaboration with industry, to structure these materials such that they can be fabricated into devices.

Application-specific integrated circuits (ICs) and edge computing have become indispensable in extracting, digitizing, and processing analog sensor information. Complexity has increased to the point that entire systems are now integrated in a chip (system-on-chip, SoC). New technologies are needed to continue to increase the level of integration: novel interconnect techniques to enable “vertical 3D integration” of sensor and analog and digital data-processing elements; and new processes to integrate photonics or RF transmitter components for optical or wireless communications (“4D integration”). For example, current fifth generation (5G) wireless offers up to 20Gbps connectivity with 1ms latency and could enable new communication modes. The ultimate goal is a process that results in a monolithic device: all sensor, analog and digital processing, and communication functions in “one piece of silicon.”

Detectors often must operate in extreme environments: very high levels of radiation; or cryogenic (~100 K) or deep cryogenic (≤ 4 K) temperatures. For such environments, research is needed into (i) process technologies, models, and standard cell libraries; (ii) building blocks for system on chip (e.g., low-power, high-speed I/O protocols; wireless; power management; Single Event Effect mitigation techniques; pico-second precision clock and timing circuits); and (iii) emerging design and verification methodologies, including processes with Internet of Things (IoT) distributed network technology and in-hardware neural networks, neuromorphic processing, and asynchronous techniques. The ultimate goal is on-detector electronics capable of extracting high level physics information from simultaneous multi-channel, in-hardware processing of the initial analog raw signals.

Data acquisition begins at the front-end sensors and takes the data to permanent storage, either in a triggered or streaming architecture. Future large detector systems require real-time, sustained data transmission and processing reaching the exascale. Research is needed into high-bandwidth, radiation-hard, low-power data links; real-time processing on heterogeneous hardware employing low-latency artificial intelligence and machine learning techniques; neuromorphic computing; and advanced feature extraction for triggering. The ultimate goal is to develop technologies for detector systems capable of autonomous operation, including self-calibration and -alignment as well as self-diagnosis and -repair.

NOTE: Each applicant institution is limited to no more than 2 letters of intent and 2 proposals as the lead institution.

Teaming Arrangements

Proposals will be accepted only from multi-investigator teams, not single investigators. Multi-investigator teams may be at multiple institutions. Lead DOE Laboratories are encouraged to form partnerships with academia, industry, other DOE Laboratories, and other agencies or agencies' FFRDCs.

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 must submit one proposal from a designated lead institution with all other team members proposed as subawards. Multi-institutional teams must be constituted with a lead institution requesting greater funding than any other institutional team member.

Non-Federal entities, other Federal agencies, and another Federal agency's FFRDCs¹ may be proposed as subawardees.

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

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

Section II – AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT

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

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

B. ESTIMATED FUNDING

Research Awards are expected to be made for a period of three years at a funding level appropriate for the proposed scope, with out-year support contingent on the availability of funds and satisfactory progress. Total funding up to \$54 million over three years is expected to be available to support this Announcement subject to appropriation of funds by the Congress.

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

C. MAXIMUM AND MINIMUM AWARD SIZE

(See B. Estimated Funding section above.)

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

Ceiling

\$2,000,000 per year

Floor

\$750,000 per year

D. EXPECTED NUMBER OF AWARDS

(See B. Estimated Funding Section above.)

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

E. ANTICIPATED AWARD SIZE

(See B. Estimated Funding Section above.)

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

F. PERIOD OF PERFORMANCE

(See B. Estimated Funding section above.)

DOE anticipates making awards with a project period of **three years**.

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

G. TYPE OF PROPOSAL

DOE will accept new 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.

Section III – ELIGIBILITY INFORMATION

A. ELIGIBLE APPLICANTS AND TOPICS

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

B. COST SHARING

Cost sharing is not required.

C. ELIGIBLE INDIVIDUALS

Eligible individuals with the skills, knowledge, and resources necessary to carry out the proposed research as a 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 **2** letters of intent and **2** proposals as the lead institution.

- Letters of intent must include the signature from the National Laboratory Director. All letters of intent from one institution must be signed by the same person.
- Proposals in excess of the limited number of submissions may be declined without review.
- There is no limitation to the number of proposals on which an institution appears as a partner (not the lead institution).

Proposals that are not submitted with substantially similar titles, teams, researchers, and proposed research to a letter of intent may be declined without merit review.

Section IV – PROPOSAL AND SUBMISSION INFORMATION

A. ADDRESS TO REQUEST PROPOSAL PACKAGE

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

Proposals submitted outside of PAMS will not be accepted.

B. LETTER OF INTENT AND PRE-PROPOSAL

1. Letter of Intent

LETTER OF INTENT DUE DATE

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

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

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

- A cover sheet containing the following information:
 - Title of Proposal
 - Lead Institution
 - Administrative Point of Contact name, telephone number, email:
 - Lead PI name, telephone number, email:
 - DOE National Laboratory Announcement Number:
 - PI Phone Number, PI Email Address
 - Research Areas: Include **at least two Research Areas** from list in Section I
 - Signature of the National Lab Director. In the case that a different senior lab official must sign, documentation must be included that indicates authorization from the director to the signing official.
- This information must be followed by a clear and concise description of the objectives and technical approach of the proposed research. The description of the proposed research may not exceed **two pages**, when printed using standard letter-size (8.5 x 11 inch) paper with 1 inch margins (top, bottom, left, and right). The font must not be smaller than 11 point. Figures and references, if included, must fit within the two-page limit.

In addition to submission of the letter of intent into PAMS, each applicant should submit the following two tables via email using the provided Excel templates, as described below:

Senior/key personnel on the LOI and institutional affiliations

Include the names and institutional affiliations of all Senior/Key Personnel on the letter of intent, including the Lead PI.

Collaborators for senior/key personnel on the LOI

This list should include, for the Lead PI and all Senior/Key Personnel:

- Collaborators and Co-editors: List in alphabetical order all persons (last and first name and their current organizational affiliation) who are, or who have been, collaborators or co-authors on a research project, book or book article, report, abstract, or paper during the 48 months preceding the submission of this proposal. For publications or collaborations with more than 10 authors or participants, only list those individuals in the core group with whom the PI interacted on a regular basis while the research was being done. Also, list any individuals who are currently, or have been, co-editors on a special issue of a journal, compendium, or conference proceedings during the 24 months preceding the submission of this LOI. If there are no collaborators or co-editors to report, state “None.”
- Graduate and Postdoctoral Advisors and Advisees: List the first and last names and current organizational affiliations of your graduate advisor(s) and principal postdoctoral sponsor(s). Also, list the names and current organizational affiliations of your graduate students and postdoctoral associates.
- Personnel must be listed with their full first and last names and their institutions must be spelled out.

NOTE: For purposes of uniformity, Excel templates are provided through the Office of Science Lab Announcements Page (<https://science.osti.gov/grants/Lab-Announcements/Open>) and should be used in preparing these two tables. Applicants should follow the exact format of the template tables because the tabular information will be compiled across all LOIs. This includes the elements listed below, as applicable to each table. **Each applicant should submit the original Excel files used to create its tables via email to Microelectronics@science.doe.gov no later than the LOI due date printed on the cover of this announcement. The subject line of the email should read “Microelectronics Tables:” followed by the Lead PI’s last name and the lead organization name, e.g. “Microelectronics Tables: Jones, XYZ National Lab”.**

- Do not merge name or institution cells, even if individuals share the same institution.
- Do not change the order of the columns.
- For the Senior/Key Personnel and Collaborator Tables, do not include any additional information (e.g. “PI”, “Co-PI”, or footnote symbols) under “Last Name” and “First Name” and do not include departmental affiliations under “Institution.”
- If an individual has a joint appointment, separate the institutions with a “/” (i.e. “Univ of X / National Lab Y”).

The LOI must be machine-readable. Do not submit a scanned image of a printed document.

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

The two tables accompanying the LOI must be submitted by email as described above to Microelectronics@science.doe.gov. Instructions for completing and submitting each table are included on the “Instructions” tab in each Excel template.

There is no requirement to seek approval if teaming arrangements, proposed personnel, topics, or the anticipated title change between submitting the LOI and when a proposal is submitted.

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

Feedback to letters of intent will not be provided to submitters.

2. Pre-proposal

Not applicable.

C. PROPOSAL SUBMISSION AND CONTENT

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: Current and Pending Support
 - Appendix 3: Bibliography and References Cited
 - Appendix 4: Facilities and Other Resources
 - Appendix 5: Equipment
 - Appendix 6: Data Management Plan
 - Appendix 7: Other Attachments (optional)

SUBMISSION INSTRUCTIONS

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

Important Instructions to the Sponsored Research Office of Submitting Institutions: SC requires that you create one single machine readable PDF file that contains the DOE Title Page,

project narrative, biographical sketch, current and pending support, bibliography and references cited, facilities and other resources, equipment, data management plan, and other attachments. This single PDF file may not be scanned from a printed document and must be uploaded in PAMS.

WARNING: The PAMS website at <https://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.

PROPOSAL DUE DATE

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

LETTERS

Letters of support may be included as an appendix to the research narrative. Reviewers are not required to consider information in this appendix.

2. Abstract

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

Project Title

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

Text of abstract

The project summary must not exceed 1 page when printed using standard letter-size (8.5 by 11 inch) paper with 1 inch margins (top, bottom, left and right) with font not smaller than 11 point. The one-page project summary/abstract should be placed in a separate, single pdf document and attached on the appropriate screen in PAMS.

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

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

3. Budget and Justification

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

Budgets are required for the entire project period. A budget form should be completed for each budget period of the award, and a cumulative budget form for the entire project period will be populated by PAMS. PAMS will calculate the cumulative budget totals for you.

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

4. Proposal

DOE TITLE PAGE
(PART OF PROJECT NARRATIVE)

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

- The project title:
- Applicant/Institution:
- Administrative Point of Contact name, telephone number, email:
- Lead PI name, telephone number, email:
- DOE National Laboratory Announcement Number:
- PAMS Letter of Intent Tracking Number:
- Research Areas: Include **at least two Research Areas** from list in Section I

Each applicant should update the Excel files used to create the two tables for the LOI and submit them via email to Microelectronics@science.doe.gov no later than the proposal due date printed on the cover of this announcement. The subject line of the email should read “Microelectronics Tables:” followed by the Lead PI’s last name and the lead organization name, e.g. “Microelectronics Tables: Jones, XYZ National Lab”.

For multi-institutional applications, on a separate page as a supplement to the cover page, the application must include the following table, which will not count toward the page limit for the Project Narrative:

Summary Budget Table

Summary budget for lead institution and all partner institutions**				
Institution Name	Year 1 Budget (\$K)	Year 2 Budget (\$K)	Year 3 Budget (\$K)	Total Budget
Institution 1 (Lead org.)				
Institution 2				
Total Budget				

** Should include all partner institutions, including the lead institution, whether or not the institution is proposed to receive DOE funds under the award. Include the total costs (\$ in thousands) of the budget request in each year for each institution and totals for all rows and columns.

Project Narrative

The project narrative **must not exceed a page limit of 20 pages** of technical information, including charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard letter-size (8.5 x 11 inch) paper with 1 inch margins (top, bottom, left, and right). The font must not be smaller than 11 point. Merit reviewers will only consider the number of pages specified in the first sentence of this paragraph. This page limit does not apply to the Title Page, Budget Page(s), Budget Justification, biographical material, publications and references, and appendices, each of which may have its own page limit defined later in this Announcement.

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

Background/Introduction: Explanation of the importance and relevance of the proposed work as well as a review of the relevant literature.

Project Objectives: This section should provide a clear, concise statement of the specific objectives/aims of the proposed project.

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

Timetable of Activities: Timeline for all major activities including milestones and deliverables.

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

The Project Narrative comprises the research plan for the project. It should contain enough background material in the Introduction, including review of the relevant literature, to demonstrate sufficient knowledge of the state of the science. The major part of the narrative should be devoted to a description and justification of the proposed project, including details of the method to be used. It should also include a timeline for the major activities of the proposed project, and should indicate which project personnel will be responsible for which activities. There should be no ambiguity about which personnel will perform particular parts of the project, and the time at which these activities will take place.

APPENDIX 1: BIOGRAPHICAL SKETCH

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

- Provide the biographical sketch information as an appendix to your project narrative.
- Do not attach a separate file.
- The biographical sketch appendix will not count in the project narrative page limitation.
- The biographical information (curriculum vitae) for each person must not exceed 2 pages when printed on letter-size (8.5 x 11 inch) paper with 1 inch margins (top, bottom, left, and right) with font not smaller than 11 point

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

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

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

APPENDIX 2: CURRENT AND PENDING SUPPORT

Provide a list of all current and pending support for the PI and senior/key personnel, including subawardees. Provide the Current and Pending Support as an appendix to your project narrative. Concurrent submission of an application to other organizations for simultaneous consideration will not prejudice its review.

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

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

APPENDIX 3: BIBLIOGRAPHY & REFERENCES CITED

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

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

APPENDIX 4: FACILITIES & OTHER RESOURCES

This information is used to assess the capability of the organizational resources, including subawardee resources, available to perform the effort proposed. Identify the facilities to be used (Laboratory, Animal, Computer, Office, Clinical and Other). If appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. Describe only those resources that are directly applicable to the proposed work. Describe other resources available to the project (e.g., machine shop, electronic shop) and the extent to which they would be available to the project. For proposed investigations requiring access to experimental user facilities maintained by institutions other than the applicant, please provide a document from the facility manager confirming that the researchers will have access to the facility. Please provide the Facility and Other Resource information as an appendix to your project narrative.

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

APPENDIX 5: EQUIPMENT

List major items of equipment already available for this project and, if appropriate identify location and pertinent capabilities. Provide the Equipment information as an appendix to your project narrative.

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

APPENDIX 6: DATA MANAGEMENT PLAN

Provide a Data Management Plan (DMP) as an appendix to the research narrative.

- This appendix should not exceed a page limit of 3 pages including charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard letter-size (8.5 x 11 inch) paper with 1 inch margins (top, bottom, left, and right)
- Do not attach a separate file.
- This appendix will not count in the project narrative page limitation.

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

APPENDIX 7: OTHER ATTACHMENT

If you need to elaborate on your responses to the PAMS Cover Page, please provide the Other Attachment information as an appendix to your project narrative. Information not easily accessible to a reviewer may be included in this appendix, but do not use this appendix to circumvent the page limitations of the proposal. Reviewers are not required to consider information in this appendix.

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

D. SUBMISSIONS FROM SUCCESSFUL APPLICANTS

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

E. SUBMISSION DATES AND TIMES

1. Letter of Intent Due Date

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

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

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

4. Late Submissions

Delays in submitting letters of intent and proposals may be unavoidable. DOE has accepted late submissions when applicants have been unable to make timely submissions because of widespread technological disruptions 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 Funding Opportunity Announcement to discuss the option of a late submission. Contacting the Program Office/Manager after the deadline may reduce the likelihood that a request will be granted.

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

Section V - PROPOSAL REVIEW INFORMATION

A. CRITERIA

1. Initial Review Criteria

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

2. Merit Review Criteria

Proposals will be subjected to scientific merit review (peer review) and will be evaluated against the following criteria.

- Scientific and/or Technical Merit of the Proposed Research
- Appropriateness of the Proposed Method or Approach
- Competency of Applicant's Personnel and Adequacy of Proposed Resources
- Reasonableness and Appropriateness of the Proposed Budget
- Strength of the Management Plan

The evaluation process will also include program policy factors such as the relevance of the proposed research to the terms of the DOE National Laboratory Announcement and the agency's programmatic needs, the balance of activities within the program, and the utility of the proposed activities to the broader scientific community. Note that external peer reviewers are selected with regard to both their scientific expertise and the absence of conflict-of-interest issues. Both Federal and non-Federal reviewers may be used, and submission of a proposal constitutes agreement that this is acceptable to the investigator(s) and the submitting institution.

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

SCIENTIFIC AND/OR TECHNICAL MERIT OF THE PROPOSED RESEARCH

- What is the scientific innovation of proposed effort?
- How does the proposed work compare with other efforts in its field, both in terms of scientific and/or technical merit and originality?
- How might the results of the proposed work impact the direction, progress, and thinking in relevant scientific fields of research?
- What is the likelihood of achieving influential results?
- How well does the Data Management Plan for the proposed research meet the Office of Science requirements as defined on the Digital Data Management website (<https://science.osti.gov/Funding-Opportunities/Digital-Data-Management>)? To what extent

will research products, including data, be made available and reusable to advance the field of research?

APPROPRIATENESS OF THE PROPOSED METHOD OR APPROACH

- To what extent does the proposed effort employ innovative concepts or methods?
- How logical and feasible are the approaches?
- What are the strengths and weaknesses of the conceptual framework, methods, and analyses? How well are these justified and developed, and are they likely to lead to scientifically valid conclusions?
- How well does the applicant recognize significant potential problems and consider alternative strategies?

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 and potential of the research team?
- How well qualified is the team to carry out the proposed work?
- Are the environment and facilities adequate for performing the proposed effort?
- How does the proposed work take advantage of unique facilities and capabilities?

REASONABLENESS AND APPROPRIATENESS OF THE PROPOSED BUDGET

- How appropriate are the proposed budget and staffing levels to carry out the proposed research?
- How well is the proposed budget aligned with the scope of work?
- How adequate is the commitment by senior contributors? If any components of the project rely upon efforts by unpaid contributors, how appropriate and important are their contribution to advancing the goals of the project?

STRENGTH OF THE MANAGEMENT PLAN

- For team proposals, what are the strengths and weaknesses of the proposal's management plan, including the proposed timeline?
- If appropriate, comment on how the team will achieve synergy among the participants, including integration of experimental and theoretical work (if both are included in the proposed research).

B. REVIEW AND SELECTION PROCESS

1. Merit Review

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

2. 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
- Training the next generation of researchers
- Commitment to sharing the results of research
- Ensuring opportunities to investigators not currently supported by DOE
- Promoting the diversity of supported investigators
- Promoting the diversity of institutions receiving awards
- Multi-disciplinary nature of the proposed 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.

C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES

It is anticipated that the award selection will be completed by August 2021. It is expected that awards will be made in Fiscal Year 2021.

Section VI - AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES

1. Notice of Selection

Selected Applicants Notification: DOE will notify applicants selected for award. This notice of selection is not an authorization to begin performance.

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

2. Notice of Award

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

B. ADMINISTRATIVE AND POLICY REQUIREMENTS

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

[1. Availability of Funds](#)

[2. Commitment of Public Funds](#)

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

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

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

[6. Funding Restrictions](#)

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

[8. Modification](#)

[9. Proprietary Proposal Information](#)

[10. Publications](#)

C. REPORTING

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

Section VII - QUESTIONS/AGENCY CONTACTS

A. QUESTIONS

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

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

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

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

B. AGENCY CONTACTS

PAMS Customer Support	855-818-1846 (toll-free) 301-903-9610 sc.pams-helpdesk@science.doe.gov
Program Contact	Microelectronics@science.doe.gov

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

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

Section VIII – SUPPLEMENTARY MATERIAL

A. HOW-TO GUIDES

1. How Consortia May be Used

INCORPORATED CONSORTIA

Incorporated consortia, which may include domestic and/or foreign entities, are eligible to apply for funding as a prime recipient (lead organization) or subawardee (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), which may include domestic and foreign entities, must designate one member of the consortium to serve as the prime recipient/consortium representative (lead organization). There is no requirement that subawards be formalized into unincorporated consortia.

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

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

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

2. How to Submit Letters of Intent

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

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

Submit Your Letter of Intent:

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

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

<p>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</p>

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

3. How to Submit a Pre-Proposal

It is important that the pre-proposal be a single file with extension .pdf, .docx, or .doc. The filename must not exceed 50 characters. The PI and anyone submitting on behalf of the PI must register for an account in PAMS before it will be possible to submit a pre-application. All PIs and those submitting pre-proposals on behalf of PIs are encouraged to establish PAMS accounts as soon as possible to avoid submission delays.

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

Submit Your Pre-Proposals:

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

- At the bottom of the screen, click the “Submit to DOE” button to save and submit the preproposal to DOE.
- Upon submission, the PI will receive an email from the PAMS system <PAMS.Autoreply@science.doe.gov> acknowledging receipt of the preproposal.

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

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

4. How to Prepare and Submit a Proposal

SUBMITTING A PROPOSAL

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

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

- Complete the sections in PAMS one at a time, starting with the cover page and following the instructions for each section.
- Click the “+View More” link at the top of each section to expand the onscreen instructions. On the budget section, click the “Budget Tab Instructions” link to obtain detailed guidance on completing the budget form.
- Save each section by selecting either “Save” (to stay in the same section) or “Save... and Continue to the Next Section” (to move to the next section) from the dropdown menu at the bottom of the screen, followed by clicking the “Go” button.
- If you save the proposal and navigate away from it, you may return later to edit the proposal by clicking the “View My Existing Proposals” or “My Proposals” links within PAMS.
- You must enter a budget for each annual budget period.
- You must also enter a budget for each proposed sub-award. The sub-award section can be completed using the same steps used for the budget section.
- In the attachments section of the lab proposal, the abstract, the budget justification, and the proposal narrative are required and must be submitted as separate files.
- You must bundle everything other than the budget, abstract, and budget justification into one single PDF file to be attached under “Proposal Attachment.”
- Do not attach anything under “Other Attachments.”
- To upload a file into PAMS, click the “Attach File” button at the far right side of the screen. Click the “Browse” (or "Choose File" depending on your browser) button to search for your file. You may enter an optional description of the file you are attaching. Click the “Upload” button to upload the file.
- Once you have saved all of the sections, the “Submit to DOE” option will appear in the dropdown menu at the bottom of the screen.
- To submit the proposal, select “Submit to DOE” from the dropdown menu and then click the “Go” button.
- Upon submission, the PI will receive an email from the PAMS system <PAMS.Autoreply@science.doe.gov> acknowledging receipt of the proposal.
- The proposal will also appear under My Proposals with a Proposal Status of “Submitted to DOE.”

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

PROPOSAL PREPARATION

All files submitted a part of a proposal must be PDF files unless otherwise specified in this Announcement. Attached PDF files must be plain files consisting of text, numbers, and images without editable fields, signatures, passwords, redactions, or other advanced features available in some PDF-compatible software. Do not use PDF portfolios or binders.

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

- Please limit file names to 50 or fewer characters

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

RESUBMISSION OF PROPOSALS

Proposals submitted under this announcement may be withdrawn from consideration by using the PAMS website at <https://pamspublic.science.energy.gov>. Proposals may be withdrawn at any time between when the applicant submits the proposal and when DOE makes the proposal available to merit reviewers. Such withdrawals take effect immediately and cannot be reversed. Please exercise due caution. After the proposal is made available to merit reviewers, the applicant may contact the DOE program office identified in this Announcement to request that it be withdrawn.

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

IMPROPER CONTENTS OF PROPOSALS

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

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

5. How to Prepare a Biosketch

A biosketch is to provide information that can be used by reviewers to evaluate the PI's potential for leadership within the scientific community. Examples of information of interest are invited and/or public lectures, awards received, scientific program committees, conference or workshop organization, professional society activities, special international or industrial partnerships, reviewing or editorship activities, or other scientific leadership experiences.

SC requires the use of the format approved by the National Science Foundation (NSF), which may be generated by the Science Experts Network Curriculum Vita (SciENCv), a cooperative

venture maintained at <https://www.ncbi.nlm.nih.gov/sciencv/>, and is also available at <https://nsf.gov/bfa/dias/policy/nsfapprovedformats/biosketch.pdf>. The use of a format required by another agency is intended to reduce the administrative burden to researchers by promoting the use of common formats.

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

- **Education and Training:** Undergraduate, graduate and postdoctoral training, provide institution, major/area, degree and year.
- **Research and Professional Experience:** Beginning with the current position list, in chronological order, professional/academic positions with a brief description.
- **Publications:** Provide a list of up to 10 publications most closely related to the proposed project. For each publication, identify the names of all authors (in the same sequence in which they appear in the publication), the article title, book or journal title, volume number, page numbers, year of publication, and website address if available electronically. Patents, copyrights and software systems developed may be provided in addition to or substituted for publications. An abbreviated style such as the Physical Review Letters (PRL) convention for citations (list only the first author) may be used for publications with more than 10 authors.
- **Synergistic Activities:** List no more than 5 professional and scholarly activities related to the effort proposed.

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

6. How to Prepare Current and Pending Support

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

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

SC requires the use of the format approved by the National Science Foundation (NSF), which may be generated by the Science Experts Network Curriculum Vita (SciENCv), a cooperative venture maintained at <https://www.ncbi.nlm.nih.gov/sciencv/>, and is also available at

<https://www.nsf.gov/bfa/dias/policy/nsfapprovedformats/cps.pdf>. The use of a format required by another agency is intended to reduce the administrative burden to researchers by promoting the use of common formats.

For every activity, list the following items:

- The sponsor of the activity or the source of funding
- The award or other identifying number
- The title of the award or activity. 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
- Briefly describe the research being performed and explicitly identify any overlaps or synergies with the proposed research. If there is insufficient space on the Current and Pending Support form, append a section entitled ‘Scope and Delineation of Research’ to the Current and Pending Support form with a brief description of the research scope of each project and explicit identification of any overlap or synergy with the proposed work.

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.

7. 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>

8. How to Prepare a Budget and Justification

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

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

Budget Fields

Section A Senior/Key Person	For each Senior/Key Person, enter the requested information. List personnel, base salary, the number of months that person will be allocated to the project, requested salary, fringe benefits, and the total funds requested for each person. The requested salary must be the product of the base salary and the effort. Include a written narrative in the budget justification that justifies the need for requested personnel. Within the justification, explain the fringe benefit rate used if it is not the standard faculty rate.
Section B Other Personnel	List personnel, the number of months that person will be allocated to the project, requested salary fringe benefits, and the total funds requested for each person. Include a written narrative in the budget justification that fully justifies the need for requested personnel. Within the justification, provide the number of positions being filled in each category of other personnel.
Section C Equipment	For the purpose of this budget, equipment is designated as an item of property that has an acquisition cost of \$5,000 or more and an expected

	<p>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.</p>
Section D Travel	<p>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.</p>
Section E Participant/Trainee Support Costs	<p>If applicable, submit training support costs. Educational projects that intend to support trainees (precollege, college, graduate and post graduate) must list each trainee cost that includes stipend levels and amounts, cost of tuition for each trainee, cost of any travel (provide the same information as needed under the regular travel category), and costs for any related training expenses. Participant costs are those costs associated with conferences, workshops, symposia or institutes and breakout items should indicate the number of participants, cost for each participant, purpose of the conference, dates and places of meetings and any related administrative expenses.</p> <p>Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis).</p>
Section F Other Direct Costs	<ul style="list-style-type: none"> • Materials and Supplies: Enter total funds requested for materials and supplies in the appropriate fields. In the budget justification, indicate general categories such as glassware, and chemicals, including an amount for each category (items not identified under "Equipment"). Categories less than \$1,000 are not required to be itemized. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). • Publication Costs: Enter the total publication funds requested. The proposal budget may request funds for the costs of documenting, preparing, publishing or otherwise making available to others the findings and products of the work

	<p>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).</p> <ul style="list-style-type: none"> • 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.
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9. How to Register in PAMS

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

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

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

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

CREATE PAMS ACCOUNT:

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

- Click the “No, I have never had an account” link and then the “Create Account” button.
- You will be prompted to enter your name and email address, create a username and password, and select a security question and answer. Once you have done this, click the “Save and Continue” button.
- On the next page, enter the required information (at least one phone number and your mailing address) and any optional information you wish to provide (e.g., FAX number, website, mailstop code, additional email addresses or phone numbers, Division/Department). Click the “Create Account” button.
- Read the user agreement and click the “Accept” button to indicate that you understand your responsibilities and agree to comply with the rules of behavior for PAMS.
- PAMS will take you to the “Having Trouble Logging In?” page. (If you have been an SC merit reviewer or if you have previously submitted an application, you may already be linked to an institution in PAMS. If this happens, you will be taken to the PAMS home page.)

REGISTER TO YOUR INSTITUTION:

- Click the link labeled “Option 2: I know my institution and I am here to register to the institution.” (Note: If you previously created a PAMS account but did not register to an institution at that time, you must click the Institutions tab and click the “Register to Institution” link.)
- PAMS will take you to the “Register to Institution” page.

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

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

10. How to View Proposals in PAMS

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

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

B. POLICY PROVISIONS

1. Availability of Funds

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

2. Commitment of Public Funds

The Contracting Officer is the only individual who can make awards or commit the Government to the expenditure of public funds. A commitment by other than the Contracting Officer, either explicit or implied, is invalid.

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

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

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

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

4. Evaluation and Administration by Non-Federal Personnel

In conducting the merit review evaluation, the Government may seek the advice of qualified non-Federal personnel as reviewers. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The applicant, by submitting its proposal, consents to the use of non-Federal reviewers/administrators. Non-Federal reviewers must sign a conflict of interest and a certificate of confidentiality prior to reviewing a proposal. Non-Federal personnel conducting administrative activities must sign a non-disclosure agreement.

5. Federal, State, and Local Requirements

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

6. Funding Restrictions

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

7. Government Right to Reject or Negotiate

DOE reserves the right, without qualification, to reject any or all proposals received in response to this DOE National Laboratory Announcement and to select any proposal, in whole or in part, as a basis for negotiation and/or award.

8. Modification

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

9. Proprietary Proposal Information

Patentable ideas, trade secrets, proprietary or confidential commercial or financial information, disclosure of which may harm the applicant, should be included in a proposal only when such information is necessary to convey an understanding of the proposed project. The use and disclosure of such data may be restricted, provided the applicant includes the following legend on the first page of any document included in the proposal that contains such proprietary information and specifies the pages of the document which are to be restricted:

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

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

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

10. 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 instructions contained in the Reporting Requirements Checklist incorporated in all Assistance Agreements.