

**Department of Energy (DOE)
Office of Science (SC)**



National Quantum Information Science Research Centers

**DOE National Laboratory Program Announcement Number:
LAB 25-3530**

Announcement Type: Amendment 000002

Amendment 000002 is issued to correct inconsistencies in the numbering of tables and appendices in Section IV. Additionally, the due date has been changed to June 11. Amendment 000001 is issued to remove references to diversity, equity, and inclusion; and to remove references to PIER plans

Announcement Issue Date:	January 15, 2025
Submission Deadline for Pre-Proposal:	Wednesday, March 12, 2025, at 5 PM Eastern Time A Pre-Proposal is required Pre-Proposals must be submitted by an authorized institutional representative
Pre-Proposal Response Date:	Wednesday, April 9, 2025, at 11:59 PM Eastern Time
Submission Deadline for Proposals:	Wednesday, June 11, 2025, at 5 PM Eastern Time

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I. Basic Information

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

Executive Summary

DOE SC hereby announces its interest in receiving proposals from multi-institutional, multi-disciplinary teams (requesting support between \$20 and \$25 million per year) to establish National Quantum Information Science Research Centers referred to in the rest of this announcement as “Centers.” The goal of this announcement is to select proposals that will accelerate the transformational advances in basic science and quantum-based novel-technology platforms needed to develop world-leading capabilities in Quantum Information Science (QIS), and in support of the National Quantum Initiative Act.¹

Funding Details

Expected total available funding	\$625 million
Expected number of awards	Five awards
Expected dollar amount of individual awards	\$125 million
Expected award project period	Five years

All funding amounts above are subject to the availability of funds appropriated by Congress and future year budget authority.

Key Facts

Announcement Title	National Quantum Information Science Research Centers
Announcement Number	LAB 25-3530
Announcement Type	Initial

Key Dates

Key dates are printed on the cover of this Announcement.

Agency Contact Information

PAMS Customer Support	855-818-1846 (toll-free) 301-903-9610 sc.pams-helpdesk@science.doe.gov
Technical/Scientific Program Contact	For questions, please contact: QISCenters@science.doe.gov

Department of Energy, Office of Inspector General Hotline

The Office of Inspector General (OIG) maintains a Hotline to facilitate the reporting of

¹Public Law 115-368, <https://www.congress.gov/115/bills/hr6227/BILLS-115hr6227enr.pdf>

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

Recommendation

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

II. Eligibility

A. Eligible Applicants

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

B. Cost Sharing

Cost sharing is not required.

C. Eligible Individuals

Eligible individuals with the skills, knowledge, and resources necessary to carry out the proposed research as a Principal Investigator (PI) are invited to work with their organizations to develop a proposal. Individuals from underrepresented groups as well as individuals with disabilities are always encouraged to apply. The PI will hereafter be referred to the Center Director.

CENTER DIRECTOR

Proposals must designate one and only one investigator as the Center Director, who will exercise overall scientific control and direction of the proposed research. The Center Director must be employed by, or have a written agreement in place to be hired by, the Lead Institution with an intent to remain employed by the Lead Institution for the duration of the award. If the proposed Center Director will not be employed by the Lead Institution at the time of the award, the proposal may be declined without further review.

D. Limitations on Submissions

Applicant institutions are limited to no more than two pre-proposals as the lead institution.

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

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

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

LIMITATIONS ON CENTER DIRECTORS

An individual cannot be proposed as Center Director on more than one pre-proposal or proposal. The Center Director on a pre-proposal or proposal may also be listed as a senior or key

personnel, including any role on a proposed subaward, on an unlimited number of separate submissions.

Center Directors must be in a permanent position at the applicant institution. Individuals in term-limited appointments, whether as adjunct, visiting faculty, fellows, or similar appointments, are not eligible to be proposed as a Center Director. Individuals in part-time permanent positions are eligible to be proposed as a Center Director.

Individuals in a joint appointment are eligible to be proposed as a Center Director if work will be performed at the applicant institution and if the Center Director is a paid employee of the applicant institution. A paid employee is one that is on the applicant institution's payroll, receiving wages and benefits in accordance with the applicant institution's normal wage and benefit practices, and whose position is not governed by any arrangement, agreement, or contract between the applicant institution and another institution.

Individuals receiving less than half of their salary and benefits from the applicant laboratory may not be named as the Center Director in a proposal under this Announcement, regardless of any arrangement between the laboratory and another institution. Such individuals may be named in other senior/key roles.

III. Program Description

A. Purpose

The DOE SC hereby announces its interest in receiving proposals from multi-institutional, multi-disciplinary teams (requesting support between \$20 and \$25 million per year) to support National Quantum Information Science Research Centers referred to in the rest of this announcement as “Centers.” The goal of this Announcement is to select proposals that will accelerate the transformational advances in basic science and quantum-based novel-technology platforms needed to develop world-leading capabilities in Quantum Information Science (QIS), and in support of the National Quantum Initiative Act.²

SUPPLEMENTARY INFORMATION

Program Objective

The ability to exploit intricate quantum mechanical phenomena to create fundamentally new ways of obtaining and processing information is at the threshold of a technological revolution. The rapid progress in this field promises profound impacts on scientific discovery and technological innovation in the coming decades. In competitive terms, QIS is creating potentially transformational opportunities and technically complex, urgent challenges for the Nation, as growing international interest and investments fuel accelerating global activity in quantum science and technology. These opportunities and challenges demand a long-term, large-scale commitment of U.S. scientific and technological resources to multi-institutional, multi-disciplinary efforts that are commensurate with world leadership in this pivotal field. This has been recognized on the Federal level by the National Strategic Overview for Quantum Information Science in September 2018³ and the subsequent enactment of the National Quantum Initiative Act in December 2018.¹ DOE, with its unparalleled breadth and depth of activity as the Nation’s leading supporter of basic research in the physical sciences, and drawing on the unique expertise and capabilities of the DOE National Laboratory complex, has key resources and infrastructure that are integral to this strategic and targeted U.S. initiative.

DOE SC will provide support for Centers that will accelerate the transformational advances in basic science and quantum-based technology needed to assure continued U.S. leadership in QIS, consistent with the National Quantum Initiative. The purpose of these Centers will be to push the current state-of-the-art science and technology toward realizing the unique power of harnessing quantum phenomena in computing, communication, and sensing. The multi-disciplinary nature of the field, the need for precise control of complex physical systems to observe and utilize quantum behavior, and the potential for substantial economic consequences are the major drivers of the National Quantum Initiative. The Centers, coupled with a robust core research portfolio stewarded by the individual SC programs, will create the ecosystem needed to foster and

²Public Law 115-368, <https://www.congress.gov/115/bills/hr6227/BILLS-115hr6227enr.pdf>

³ National Science and Technology Council publication, <https://www.whitehouse.gov/wp-content/uploads/2018/09/National-Strategic-Overview-for-Quantum-Information-Science.pdf>

facilitate advancement of QIS with public benefits in national security, economic competitiveness, and leadership in scientific discovery.

Realizing the full potential of QIS requires a detailed understanding of how quantum components and systems behave, accurate knowledge of how to integrate components into complex systems, and precise control of the corresponding structures and functionalities. Numerous questions remain, ranging from how quantum interactions may enable innovation through the creation of novel quantum systems, to how these new quantum technologies can advance our understanding of the natural world at the most fundamental levels.

The traditional linear model of discovery science leading to design, development, and commercial deployment will be insufficient to realize this potential at an acceptable pace, due to the urgency and scale of our mission. Synergistic Center-driven approaches can collectively couple all elements of the science and technology (S&T) innovation chain in a co-design framework, whereby the levels of the chain mutually reinforce each other iteratively. The Centers will combine the talents of universities, national and federally-supported laboratories, and the private sector in concerted efforts to support rapid progress and economic advancement. Thus, each Center is expected to demonstrate the following attributes, which are reflected in the Center Development and Management Requirements described below and in Merit Review Criteria in [Section VI](#):

- **Significant National Impact:** With the goal of advancing basic research in QIS and significantly improving the competitiveness of the United States, the Centers will catalyze the wider scientific/technical communities related to their focus areas and serve as national resources, conveners, and leaders.
- **Major Cross-Cutting Challenge:** Each Center will attack a distinct major challenge of sufficient difficulty and urgency to warrant a large, multi-institutional, multi-disciplinary effort to be jointly supported by multiple programs in SC.
- **S&T Innovation Chain:** Each Center will advance both science and technology in its focus area, accelerating progress from discovery to prototypical technology and applied research, through coupled co-design approaches.
- **Large-Scale, Focused Efforts:** Each Center must have no more than three large-scale, focused efforts that define the majority of the Center's work. The objective of each focused effort should be transformational for the field. Using this approach, each Center's work will fully leverage its larger-scale team and technical breadth to deliver results and capabilities that cannot be accomplished by smaller-scale efforts.
- **QIS Ecosystem Stewardship:** The Centers will complement the existing QIS base research and other related activities within individual SC program offices and will represent coherent efforts beyond the scope of what would normally be supported by those programs individually. Additionally, the Centers will leverage other investments in DOE research and facilities; create synergies with efforts developed by other federal agencies, the private sector, and academia; and contribute to the Nation's workforce development in QIS.
- **Multi-disciplinary Leadership:** Each Center will be led by a team of experts in the multiple disciplines that blend basic scientific research, and early-stage technology development, engineering design and prototype development, drawing on expertise from DOE labs, academic institutions, and industry, as appropriate.

- **Collaborative Management Structure:** Each Center will achieve self-integration across the science and engineering disciplines that it spans such that the whole is greater than the sum of its parts. A clearly defined approach will create a synergistic team-focused culture for the Center. Active management is expected, with flexible roadmapping and well-defined processes for mid-course corrections.
- **Well-Structured Plan and Metrics:** Each Center will have clearly defined near, intermediate, and long-term goals, milestones, and deliverables as well as measured metrics of success. The metrics will be justified as evidence-based assessments of impact and accomplishments.

Pursuant to this Announcement, and subject to the availability of appropriations, SC expects to award two to five multi-disciplinary QIS Centers, to be funded at between \$20 million and \$25 million per year for a five-year award term, to conduct basic research to accelerate the advancement of QIS and related technology.

Funding will be competitively awarded to the successful applicants selected by DOE Federal officials, based on rigorous review procedures as detailed in [Section VI](#) of this Announcement. Regular science and management reviews sponsored by federal officials with panels of external experts will ensure that the Centers are making progress towards their established goals, are at the cutting edge of research and development, have appropriate interactions with partners and industry entities, and have continually implemented effective management processes.

Center Development and Management Requirements

OVERVIEW

The Centers will take a holistic approach to S&T and act as an integrator of research and development. The cross-cutting challenges to be addressed by the Centers are inherently multi-disciplinary. The Centers will require personnel with varied skills and expertise in a wide range of scientific and engineering disciplines. This depth is required for the Centers' research teams to understand the potential roadblocks and bottlenecks that must be overcome to have significant national impact in QIS. Drawing expertise from DOE labs, academic institutions, and industry as appropriate, the Centers will need to combine exceptional skill and creativity in basic scientific research with cutting-edge expertise in early-stage technology development, engineering design, and prototype development for the specific problems to be addressed.

This will require the Centers to be built on a multi-dimensional structure using essential components as outlined below. This multi-dimensional structure allows considerable flexibility in defining the mission and scope of a Center but it will also ensure that each Center addresses the seven attributes described above. It is the task of applicants to construct the Center as an integrated, synergistic whole that makes a compelling argument for impacts that require the Center-scale investment. It is also the task of applicants to propose metrics to evaluate the Center's impact, and to justify how these metrics will assess the accomplishments of the Center in the context of its mission and goals.

The following Essential Components must be incorporated in each Center:

- S&T Innovation Chain and Co-Design
- Technical Areas of Interest – topics and subtopics
- Large-scale, focused efforts
- QIS Ecosystem Stewardship
- Management Structure
- Instrumentation and Facilities

These essential components are elaborated upon in the subsequent sections and are reflected accordingly in the Merit Review Criteria in [Section VI](#).

S&T INNOVATION CHAIN AND CO-DESIGN

The QIS S&T innovation chain is the core structure on which the QIS Centers are to be built. This innovation chain comprises the following levels:

- Applications
- Prototypes
- Systems
- Devices
- Fundamental Science

Each Center must address and integrate *at least three* levels of the innovation chain including fundamental science and must blend basic research, engineering, and technology development in a *co-design framework*. Co-design involves multi-disciplinary collaboration that enables synergistic feedback among the interdependent levels of the S&T innovation chain for advancing basic research in QIS and accelerating the development of revolutionary technologies. For the duration of its work, each Center must implement a co-design approach across the levels of the chain that it includes.

The collective work of the QIS Centers will span basic research to engineering and technology development with a potential transition to industrial development. The QIS Centers will support multi-disciplinary research and development focused on the scientific barriers to enable new generations of quantum-enabled devices, systems, and prototypes across a range of applications. **The Centers will advance highly promising areas of quantum information S&T from their early stages of research to the point that the risk level will be low enough for further development by industry and successful deployment of new technologies into the marketplace.** As such, the Centers are expected to have deliverables or benchmarks that help focus the objectives of the research to the proposed short, intermediate, and long-term goals they are addressing. Each Center must have deliverables or benchmarks that are appropriate to the levels of the S&T innovation chain that it addresses.

The work of each Center will be divided into Major Thrust Areas, and as described below, each Major Thrust Area must have a designated lead. Building upon and crosscutting these thrust

areas, **each Center must have no more than three large-scale, focused efforts that define the majority of the Center's work.** The scientific and technical advancements of each Major Thrust Area are expected to fit into, and enable the success of, the focused efforts. **Each focused effort should deliver a prototype novel-technology platform, capability, or major scientific breakthrough that, in the future, can be further developed into a resource or user-facility capability for the entire QIS R&D community.** Novel technology, in this context, means exploring technology directions outside of the major focus areas of current industry investment. Using this approach, each Center's work will fully leverage its larger-scale team and technical breadth to deliver results and capabilities that cannot be accomplished by smaller-scale efforts, and in so doing, will accelerate scientific exploration that is likely to enhance U.S. economic competitiveness.

The objective of each focused effort should be transformational for the field, and accordingly, is expected to carry a significant risk profile. SC expects that proposals will aim to minimize execution risk and consider alternative strategies to maximize the value of the Center's investments in the face of potential scientific and technical obstacles.

TECHNICAL AREAS OF INTEREST

It is expected that each Center will address the needs of the research communities stewarded by more than one DOE SC program office for the public benefit and integrate elements from multiple technical areas of interest. **Each Center must integrate subtopics from at least two of the Technical Areas of Interest listed in bold below.** Subsidiary bullets provide examples of subtopics. While the lists of subtopics should not be considered exhaustive, additional subtopics that are proposed should be consistent with the Technical Areas of Interest.

- **Quantum Communication**
 - Understanding and meeting the requirements for scalable and adaptable quantum network infrastructures designed to support the transmission of diverse types of quantum information
 - Fundamental limits on information transfer in quantum systems
 - Techniques and tools to address transduction and network integration (architectures, protocols, control, heterogeneous device integration and interoperability, and so on, including coexistence of quantum and classical communications)
 - Techniques to support in-situ computation within photonic or other quantum architectures or devices for quantum communications
 - Benchmarking techniques for performance measurement and system characterization, and their application to both commercially-available and testbed systems
 - Facilities to support network development and testing

- **Quantum Computing and Simulation**
 - System architecture selection and optimization for problem domains studied by SC-supported investigators

- Understanding and meeting qubit⁴ device requirements to match architectural plans
 - Qubit control, preparation, and readout technologies to permit faster and higher-fidelity computations on larger computing platforms.
 - Development of interconnections between qubits and groups of qubits to enable scalable construction of many-qubit devices.
 - Development of novel and improved algorithms and programming paradigms for selected architectures, including quantum-classical hybrid computing approaches, especially for problem domains of interest to SC-supported investigators
 - Programmable modular quantum emulator development addressing uses for SC-supported researchers (incorporating requirements input from all SC offices), including analog simulators
 - System integration of quantum simulation, quantum communication, and quantum compute systems from device/array level up
 - Testbeds for performance measurement and algorithm development; modeling and integration of computing/communication
 - Benchmarking techniques for performance measurement and system characterization, and their application to both commercially-available and testbed systems
 - Fundamental limits of quantum computation
 - Capabilities, limitations, and new approaches with respect to quantum error detection and correction
- **Quantum Devices and Sensors**
 - Development of requirements for qubits and other quantum devices for quantum sensor and detector applications
 - Development of devices to meet quantum communication or quantum computation application requirements
 - Progress on quantum-enabled imaging devices and systems, such as for soft-matter imaging, magnetic mapping, or improved microscopy
 - Development of devices, particularly sensors, that are able to provide acceleration or enhancement of measurements for scientific applications.
 - Development of integration, interface, transduction, and control schemes for quantum device arrays
 - Improvement of device coherence, qubit lifetime, and other performance parameters
 - Modeling of device and controls performance
 - Benchmarking techniques for performance measurement and system characterization, and their application to both commercially-available and testbed systems
 - Synthesis and fabrication of engineered quantum devices
 - **Materials and Chemistry for QIS Systems and Applications**
 - Requirements for materials research for quantum communication, computing,

⁴Qubit is used here as a generic term to refer to devices whose quantum states are useful for storing and/or manipulating quantum information and the use of the term qubit is not intended to rule out qubits or other techniques using multi-level systems or other potentially-advantageous approaches.

- simulation, sensing, and imaging applications
 - Fundamental theory of materials and molecular systems for quantum applications
 - Research leading to materials and molecular systems that enable controllable quantum phenomena to meet quantum communication, computation, and sensor requirements
 - Fundamental research on device physics for next generation QIS systems, including interface science and modeling of materials performance
 - Synthesis, characterization, and fabrication research for quantum materials and processes, including integration in novel device architectures
- **Quantum Foundries**
 - Synthesis of quantum materials, structures, and devices with atomic precision
 - Fabrication and integration of photonic, superconducting, spin, atomic, ionic and topological qubit systems
 - Advanced instrumentation and tools development for quantum computers, sensors, and metrology
 - Facilities to support device test, packaging, and integration

The SC 2024 Quantum Information Science Applications Roadmap⁵ outlines a path forward for research in quantum computing, quantum sensing, and quantum networking. Please see the Roadmap for additional context on technical areas and their synergistic relationships.

QIS ECOSYSTEM STEWARDSHIP

QIS Ecosystem Stewardship refers to the role the Centers play in catalyzing broader quantum activity across the country by working with partners. It includes a Center’s interactions with the other Centers; other research entities and facilities of the DOE such as the Nanoscale Science Research Centers, the Energy Frontier Research Centers, the Energy Innovation Hubs, and the DOE labs; programs funded by other federal agencies such as National Science Foundation’s Quantum Leap Challenge Institutes and National Institute of Standards and Technology’s Quantum Economic Development Consortium (QEDC); academic institutions; and the private sector. Pursuant to the Memorandum of Understanding between DOE SC and DARPA⁶, Centers will be invited to participate in planning and coordinating future research, development, engineering, and test and evaluation activities related to quantum computing alongside DARPA-funded efforts, including the Quantum Benchmarking Initiative. These interactions should enable accelerated S&T innovation.

Each Center should describe its plans for forming partnerships and creating synergies as well as leveraging existing research, technologies, capabilities, resources, and facilities within the specific Center’s identity and goals. The plans may include (but are not limited to) research partnerships, research personnel exchanges, institution-sponsored post-doctoral or graduate fellowships, involvement in the Center advisory board, and multi-institutional seminars and

⁵ https://science.osti.gov/-/media/QIS/pdf/DOE_QIS_Roadmap_Final.pdf

⁶ <https://www.energy.gov/science/articles/advancing-quantum-research-doe-inks-mou-department-defense>

conferences. Each Center must have an external advisory board that includes industry, academic, and federal laboratory participation. Center proposals should provide details on any external advisory board members who have already been identified and describe plans for recruiting any who have not.

Applicants are also encouraged to provide information regarding their plans to create a collaborative research environment to enable cognizance of industry readiness and technology transfer and to contribute to the broader development and stewardship of the national QIS capability and ecosystem. For instance, in pursuing their specific goals, the Centers will likely discover new avenues in basic research and in technology development. To the extent that such new opportunities diverge from the Center's primary mission, these should be "spun out" as potential candidates for support from other programs within or outside of the DOE or from industry. Applicants should be explicit about how they will work with QED-C and its members to enable such transitions.

For significant national impact of the Center investments, it is crucial that the Centers build on, not duplicate, existing S&T in the public and private sectors, and that they take maximum advantage of existing facilities. Applicants should explicitly describe the existing research, technologies, capabilities, resources, and facilities that they will exploit, and how they will leverage them. In particular, the plans should address existing DOE programs and investments in research and facilities, including prior investment in Centers. Information on current SC QIS programs can be found on the QIS pages of the Office of Science⁷ or on individual SC program office web portals.

Additionally, each Center should formulate a workforce development plan. This plan may include (but is not limited to) educational/training programs; opportunities for students, postdoctoral fellows, and visiting researchers; initiatives that facilitate engagement among industry, university, and lab researchers; and outreach activities in which the Center interacts with the public. For additional information on national QIS workforce-development priorities, see the 2022 Quantum Information Science and Technology Workforce Development National Strategic Plan⁸.

MANAGEMENT STRUCTURE

Each Center must have a well-designed management structure for its establishment and operations. Key elements for the successful management of a Center include:

⁷ DOE Office of Science Initiatives, <https://www.energy.gov/science/initiatives/quantum-information-science>; Office Links: <https://science.osti.gov/ascr/Research/Quantum-Information-Science-QIS>; <https://science.osti.gov/bes/Research/qis> ; <https://science.osti.gov/hep/Research/Quantum-Information-Science-QIS>; and <https://science.osti.gov/np/Research/Quantum-Information-Science>

⁸ <https://www.quantum.gov/wp-content/uploads/2022/02/OIST-Natl-Workforce-Plan.pdf>

- A clear lead institution with strong scientific leadership, core location for the Center, and demonstrated experience managing complex interdisciplinary research and development teams.
- A clear organization and evidence-based management plan for achieving the collaborative and synergistic goals of a Center and “infusing” a culture of empowered central research management throughout the Center. Each Center must identify a Center Director, a Center Deputy Director, and Leads for Major Thrust Areas as described below:
 - Center Director: The Center Director will be the Lead PI and must be employed by the Lead Institution. See [Section II.C](#) for additional requirements. The Center Director will serve as the primary contact responsible for communications with the DOE on behalf of all of the principal investigators (PIs) in the Center.
 - Deputy Center Director: The Deputy Center Director will assist the Center Director in leading the Center and will serve as the secondary contact for the DOE.
 - Leads for Major Thrust Areas: The Leads for Major Thrust Areas will be responsible for leading and coordinating the Center PIs, research, technologies and activities under their Major Thrust Areas, which may include levels of S&T innovation chain, elements of technical areas of interest or activities involving QIS ecosystem stewardship such as interactions with different entities.
- When needed, a clear commitment to the use of state-of-the-art technology and frequent virtual meetings to enable meaningful long-distance collaboration.

Each Center must devise a detailed plan that supports this structure. This plan should directly address the following bullets and might include the representative examples described:

- Significant National Impact: Description of the activities to maximize the overall impact of the Center on advancing basic research in QIS as well as on improving the competitiveness of the United States. Each Center’s management structure must enable empowered scientist-managers to execute quick decisions to shape the course of research, building on flexible roadmaps and utilizing well-defined change processes.
- Goals, Milestones, and Metrics: Description of near, intermediate and long-term goals, milestones, and deliverables as well as metrics of success that will enable innovation and advances in the S&T chain and in technical areas of interest and provide meaningful evaluation of the Center’s role in the QIS ecosystem.
- Multi-disciplinary Collaboration: Description of the communication and coordination processes among different groups and task owners within the Center to achieve self-integration and avoid duplications. Outline of interdependencies among tasks, disciplines and institutions, including solutions to avoid situations where the progress of one institution or one group within the Center is stalled due to delay in the completion of another institution or group’s task.
- Staffing: Centers will be composed of diverse institutions including national laboratories, academia, non-profit research institutes, and the private sector, with individuals with

forefront expertise in different methodologies, technologies, and disciplines. Researchers in leadership roles should have demonstrated scientific, technical, and managerial skills.

- Intellectual Property (IP): An IP management plan that formalizes the treatment of IP issues among Center members. A suggested template for this plan is in Appendix 9.
- Data Management Plan: Proposals submitted under this Announcement are subject to the [SC Statement on Digital Data Management](#). Compliance with this statement is detailed in [Section IV](#) of this Announcement. The data management plan should also describe how a public-facing Center website will be developed and maintained. Participation of Centers in development, evaluation, and dissemination of proposed national and international standards, including standard reference materials and documentary standards, is also encouraged.

INSTRUMENTATION AND FACILITIES

Each Center will need to have available the technical capabilities and facilities that the applicant considers necessary to implement its proposed approach, including experimental, fabrication, and computational tools. A portion of the research at the Center may be devoted to developing new technological capabilities for overcoming challenges that cannot be addressed with currently available technologies and instrumentation. Research capabilities and resources to be accessed outside of the Center should be clearly identified.

While capital investment in instrumentation and start-up needs are expected as part of the Center awards, usage and leverage of existing facilities, including the Department's user facilities and other capabilities such as quantum computing testbeds and isotope production, is encouraged. DOE user facilities, including Light Sources, Neutron Scattering Sources, Nanoscale Science Research Centers, Advanced Computational Facilities, and other specialized user facilities, are considered foundational resources. As such, they are expected to serve as independent resources for the Centers funded under this Announcement. Note however that access and time allocation for user research activities at DOE user facilities are determined and administered separately from this Announcement and should not be included in the budget requests of proposals to this Announcement. In general, each facility manages the allocation of facility resources through merit-based peer review of submitted research proposals, which are evaluated for scientific merit by independent proposal review committees or panels, and for feasibility and safety by the facility, with those proposals that are most compelling being accepted and allocated time. More information on DOE user facilities including policies and processes is available on the DOE SC User Facilities⁹ and on individual facility web sites.

The Centers may develop agreements with respect to access to major scientific instrumentation, including DOE user facilities, on an as-needed basis rather than as an integral component of the initial Center request and budget, since funding at DOE user facilities is determined and administered separately from this Announcement. However, Center proposals should include descriptions of any plans for utilizing or leveraging existing resources available at user facilities or elsewhere.

⁹ DOE Office of Science User Facilities, <https://science.osti.gov/User-Facilities>

Strategies for the development of Centers may also include renovation of existing buildings and/or leasing buildings. The Centers will be funded at \$20-25 million in the first year. Part of the initial funding may be used for infrastructure investment. Allowable costs include those necessary to house the Center (including a possible lease for the first five years of the project), to renovate laboratories as needed, and to purchase research equipment and instrumentation. Costs for new construction (including new buildings or additions to existing buildings) will not be allowed in Center awards.

Biennial PI Meetings

Representatives from the awarded Centers will be expected to attend biennial PI meetings. Applicants should anticipate a need for travel to effectively communicate with other researchers and request appropriate funding in their budgets.

Teaming Arrangements

Each Center must represent a multi-institution team, and it is SC's intent to support collaboration with a diverse community of the most-promising laboratory, academic, and industry partners. **Each Center is strongly encouraged to have at least one industry team member.** All proposed team members must have concrete, well-defined roles in the proposed Center activities.

Post-Award Process

The awarded Centers' Directors will be asked to join a collective body named the Centers Executive Council. The Centers Executive Council will issue a joint Operating Plan for the Centers that will describe the coordination and communication processes among the Centers that will maximize the overall national impact. Specifically, the Operating Plan will detail processes for sharing and disseminating technical results and management best practices as appropriate. The Operating Plan will also include a joint workforce development statement that addresses the recruitment and the retention of skilled workforce, planned engagement activities with industry to facilitate technology transfer, and outreach efforts to the broader scientific community including international partners. The Operating Plan will be provisional and it will be updated periodically. It is expected that, as the Centers come to maturity, this Operating Plan will not only serve as a blueprint for their operations but it will also provide insights on how to further QIS and retain the Nation's leadership after the completion of their awards.

SC reviews of the Centers will occur periodically and will cover management processes as well as scientific and technical progress to ensure suitable progress towards the established goals. Federal oversight of the Centers will require regular oral and written communication with the Centers including formal, scheduled teleconferences concerning scientific/technical progress as well as key management issues. At the program level, management of the Centers will be closely coordinated across the SC program offices through a working group of senior technical program managers that will meet regularly. The cross-SC working group will ensure coordination, synergy, and complementarity among Centers and that a consistent management approach is applied in the review, assessment, and decision-making processes. An SC QIS Management

Council, comprising the Associate Directors of the participating program offices and chaired by the SC Deputy Director for Science Programs, will provide high-level management oversight for all SC QIS Centers.

Major Changes from the Fiscal Year 2020 Funding Opportunity Announcement

In Fiscal Year 2020, SC published [Funding Opportunity Announcement \(FOA\) DE-FOA-0002253](#)¹⁰ which solicited proposals for National Quantum Information Science Research Centers. Since that time, the five selected centers have significantly advanced the field of QIS. This Announcement serves as a recompetition of the SC QIS Centers program. There are many differences between this Announcement and FOA DE-FOA-0002253, and this Announcement must be read carefully to understand its many essential requirements, but the list below highlights some of the major differences:

1. This Announcement is open only to DOE National Laboratories as lead applicants. Other kinds of team members must be proposed as subawardees of the lead applicant. This announcement contains additional requirements on proposed Center Directors (see [Section II.C](#)).
2. This Announcement requires each Center to have one to three large-scale, focused efforts that define the majority of the Center's work.
3. This Announcement strongly encourages at least one industry team member proposed for each Center.

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.

¹⁰ The prior FOA for National Quantum Information Science Research Centers is available from https://science.osti.gov/-/media/grants/pdf/foas/2020/SC_FOA_0002253.pdf

SUBAWARDS

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

Other Federal agencies, and another Federal agency's FFRDCs¹¹ 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.

B. Program Goals, Objectives, and Priorities

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

SC accomplishes its mission and advances national goals by supporting:

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

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

¹¹ An authoritative list of all Federally Funded Research and Development Centers (FFRDCs) may be found at <https://www.nsf.gov/statistics/ffrdelist/>

C. Program History

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

D. Other Information

ANTICIPATED AWARD SIZE

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

PERIOD OF PERFORMANCE

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

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

IV. Proposal Contents and Format

A. Preliminary Submissions

1. Letter of Intent (LOI)

Not applicable.

2. Pre-proposal

PRE-PROPOSAL DUE DATE

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

ENCOURAGE/DISCOURAGE DATE

The pre-proposal response date is printed on the cover of this Announcement.

A pre-proposal is required and must be submitted by the date indicated on the cover of this Announcement.

Pre-proposals will be reviewed for responsiveness of the proposed work to the research topics identified in this Announcement and for competitiveness. DOE will send a response by email to each applicant encouraging or discouraging the submission of a proposal by the date indicated on the cover of the Announcement. Applicants who have not received a response regarding the status of their pre-proposal by this date are responsible for contacting the program to confirm this status.

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

The pre-proposal attachment should include a cover page with the following information:

Title of Preproposal

Center Director Name, Job Title

Lead Institution

Center Director Phone Number and Email Address

Announcement Number: Include the number indicated on the cover of this Announcement

List of Collaborating Institutions

PI Names and Job Titles at the Collaborating Institutions

The technical areas of interest, specified in [Section III](#), primarily addressed by the Center

The material listed here defines the required content of a cover page. Additional material is not allowed.

This cover page must be followed by a clear and concise description of the objectives and technical approach of the proposed research, including at least the following elements:

- A clear and concise statement of the mission and scope of the proposed Center and a set of integrated five-year scientific and technological goals designed to support that mission;
- Justification for the Center-scale investment as an integrated, synergistic whole;
- A description of the R&D methods and approaches that will be used to achieve the goals of the Center, and the metrics that will assess the Center’s impact and accomplishments;
- An explanation of the importance of the proposed research and development and its potential national scientific, technological, and competitiveness impact;
- A discussion of how the proposed Center is responsive to the objectives of this Announcement. Specifically, to be responsive the proposed Center must satisfy the following:
 - Assemble a large, multi-institutional, multi-disciplinary effort with a domestic organization designated as the Lead Institution
 - Incorporate each of the six Essential Components as described in [Section III](#)
 - Address and integrate at least three levels of the QIS S&T Innovation Chain
 - Include Fundamental Science as one of the levels of the Chain that it addresses
 - Integrate subtopics from at least two of the Technical Areas of Interest as described in [Section III](#)

The one-to-three large-scale, focused efforts that define the majority of the center’s work must be clearly articulated. The role of any industry team members in those efforts must be outlined.

The pre-proposal may not exceed **five (5) pages**, when printed using standard letter-size (8.5-inch x 11-inch) paper with 1-inch margins (top, bottom, left, and right). The body text font must not be smaller than 11-point. Figures and references, if included, must fit within the five-page limit. The cover page does not count toward the page limit.

In addition, the pre-proposal must include a listing of individuals who should not serve as merit reviewers of a subsequent proposal. Detailed instructions for how to craft such a listing are provided in [Section IX](#) of this Announcement. This listing will not count toward the pre-proposal’s page limit. The list of individuals must be included in Excel format using the template available from https://science.osti.gov/-/media/grants/excel/Collaborator_Template.xlsx as an “Additional Attachment” to your pre-proposal in PAMS. As described in [Section IX.C.3](#), these Excel files should contain, when known, the digital persistent identifiers, including the Open Researcher and Contributor ID (ORCID), of all listed individuals.

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

Additionally, provide the following information on a separate page. This information will not count toward the page limitation.

- List all institutions by name with each institution’s PI on the same line.

- Indicate the Center Director who will be the point of contact and coordinator for the combined research activity.
- Include a table modeled on the following chart providing summary budget information from all institutions. Provide the total costs of the budget request in each year for each institution and totals for all rows and columns.

	Year 1 Budget	Year 2 Budget	Year 3 Budget	Year 4 Budget	Year 5 Budget	Total Budget
Lead Institution						
Institution						
Institution						
Institution						

Example budget table (\$ in thousands)

PRE-PROPOSAL REVIEW

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

Any review will be based on the following criteria:

1. Responsiveness to the objectives of the Announcement.
2. Scientific and technical merit.
3. Appropriateness of the proposed research approaches.
4. Likelihood of scientific impact.

The following pre-proposals are unresponsive:

1. Pre-proposals from single institutions
2. Pre-proposals from non-domestic Lead Institutions
3. Pre-proposals that do not incorporate each of the six Essential Components
4. Pre-proposals that do not address and integrate at least three levels of the QIS S&T Innovation Chain
5. Pre-proposals that do not include fundamental science as one of the levels of the QIS S&T Innovation Chain that they address
6. Pre-proposals that do not integrate subtopics from at least two of the Technical Areas of Interest.
7. Pre-proposals that do not clearly articulate one to three large-scale, focused efforts that define the majority of the center's work or do not outline the role of any industry team members in those efforts.

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

Applicants with the highest rated pre-proposals will be encouraged to submit proposals; others will be discouraged from submitting proposals.

Written feedback about preproposals will be provided upon request after award selections have been announced.

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

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

PRE-PROPOSAL SUBMISSION

Pre-proposals are created in the software system of your choice and must be submitted electronically through the DOE SC Portfolio Analysis and Management System (PAMS) website <https://pamspublic.science.energy.gov/>. You cannot draft or edit a pre-proposal in PAMS. Do not submit a pre-proposal through [FedConnect](#) or [Grants.gov](#).

Pre-proposals may only be submitted by a user at the Center Director's institution with the "Submit to DOE" privilege in PAMS. A Center Director may draft a pre-proposal but will only be able to submit the pre-proposal for institutional countersignature.

Applicants are strongly encouraged to inform the Technical/Scientific Program Contact on this Announcement if teaming arrangements, proposed personnel, topics, or the anticipated title change between submitting the pre-proposal and when a proposal is submitted, to ensure that their proposal is properly linked to their pre-proposal and that reviewers are properly assigned to the proposal.

Detailed instructions about how to submit a pre-proposal are in [Section IX](#) of this Announcement.

B. Proposal

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

Proposals submitted outside of PAMS will not be accepted.

DOE will accept new and renewal DOE National Laboratory Proposals under this DOE National Laboratory Announcement. Please only submit a PAMS lab technical proposal in response to

this Announcement; do not submit a DOE Field Work Proposal (FWP) at this time. SC will request FWPs later from those selected for funding consideration under this Announcement.

C. Component Pieces of the Proposal

1. Summary of Proposal Contents

Each DOE National Laboratory proposal will contain the following sections:

- A Cover Page, entered into PAMS as structured data using the on-screen form
- Budget, entered into PAMS as structured data using the PAMS budget form
- Abstract (one page), entered into PAMS as a separate PDF
- Budget justification, entered into PAMS as a separate PDF
- Proposal, combined into a single pdf containing the following information:
 - Proposal Title Page
 - Table of Contents
 - Project Narrative (main technical portion of the proposal, including background/introduction, proposed research and methods, timetable of activities, and responsibilities of key project personnel)
 - Appendix 1: Biographical Sketch(es)
 - Appendix 2: Synergistic Activities (Optional)
 - Appendix 3: Current and Pending Support
 - Appendix 4: Bibliography and References Cited
 - Appendix 5: Facilities and Other Resources
 - Appendix 6: Equipment
 - Appendix 7: Data Management Plan
 - Appendix 8: Organizational Letters of Commitment
 - Appendix 9: Intellectual Property (IP) Management Plan
 - Appendix 10: QIS Center Infrastructure Plan
 - Appendix 11: Additional Institutional Commitment
 - Appendix 12: Project Timetable
 - Appendix 13: DOE/NNSA National Laboratory Renewals
 - Appendix 14: Other Attachments (optional)
- Collaborator Information

SUBMISSION INSTRUCTIONS

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

Important Instructions to the Sponsored Research Office of Submitting Institutions: SC requires that you create one single machine readable PDF file that contains the DOE Title Page, Project Narrative, biographical sketch, current and pending support, bibliography and references cited, facilities and other resources, equipment, data management plan, and other attachments. This single PDF file may not be scanned from a printed document and must be uploaded in PAMS. This must be a plain PDF file consisting of text, numbers, and images without editable

fields, signatures, passwords, redactions, or other advanced features available in some PDF-compatible software. Do not use PDF portfolios or binders. The Project Narrative will be read by SC staff using the full version of Adobe Acrobat: Please ensure that the narrative is readable in Acrobat. If combining multiple files into one Project Narrative, ensure that a PDF portfolio or binder is not created. If creating PDF files using any software other than Adobe Acrobat, please use a “Print to PDF” or equivalent process to ensure that all content is visible in the Project Narrative. Once a Project Narrative has been assembled, please submit the combined Project Narrative file through a “Print to PDF” or equivalent process to ensure that all content is visible in one PDF file that can be viewed in Adobe Acrobat.

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

LETTERS

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

Letters of collaboration for unfunded or funded collaborations should be placed in Appendix 14 (Other Attachments). Each letter of collaboration may contain two and only two sentences and must use the following format:

Dear <Center Director Name>:

If your proposal entitled, “<Proposal Name>,” is selected for funding under the Announcement Name, it is my intent to collaborate in this research by <Complete Sentence with a Very Short Description of What the Collaborator Offers to Do or Provide>.

Thank you for the opportunity to participate.

Sincerely,

<Collaborator’s Name and Signature Block>

2. Abstract

The project summary/abstract is a summary of the proposed activity suitable for distribution to

the public and sufficient to permit potential reviewers to identify conflicts of interest. It must be a self-contained document. The project summary/abstract must be comprised of

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

A sample is provided below:

<p>Project Title</p> <p>A. Smith, Lead Institution (Center Director) A. Brown, Institution 2 (Co-Investigator) A. Jones, Institution 3 (Co-Investigator)</p> <p>Text of abstract (no more than one page, excluding Project Title and list of investigators)</p>

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

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

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

3. Budget and Justification

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

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

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

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

4. Proposal

DOE TITLE PAGE
(PART OF PROJECT NARRATIVE)

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

- The project title:
- Applicant/Institution:
- Street Address/City/State/Zip:
- Postal Address:
- Administrative Point of Contact name, telephone number, email:
- Center Director name, telephone number, email:
- DOE National Laboratory Announcement Number:
- PAMS Preproposal tracking number:
- Technical areas of interest identified in [Section III](#) of this Announcement (if applicable):

TITLE PAGE SUPPLEMENT
(PART OF PROJECT NARRATIVE)

Additionally, provide the following three tables on separate pages as a supplement to the title page.

Table 1: Center Members (Center Director, Deputy Center Director, Leads for Major Thrust Areas PI’s and Senior/Key Personnel) on the proposal and institutional affiliations

Center Members			Institution
Last Name	First Name	Title	Institution Name

Identify any non-domestic institutions in Table 1 and provide an addendum for each non-domestic institution demonstrating how the non-domestic institution possesses skills, resources, and abilities that do not exist among potential domestic institutions. **If a proposal is received in which non-domestic participation is proposed but is not identified in Table 1 or a**

justification for non-domestic participation is not provided via an addendum to Table 1, the proposal will be rejected without further review.

Table 2: Summary Budget Information by Institution (\$ in thousands)

Institution Name	Institution Lead PI Last Name	Institution Lead PI First Name	Year1 Budget (\$K)	Year2 Budget (\$K)	Year3 Budget (\$K)	Year4 Budget (\$K)	Year5 Budget (\$K)	Total Budget (\$K)
Total Budget								

Provide the total costs (\$ in thousands) of the budget request in each year for each institution and totals for all rows and columns. The sum of all lines should equal the “Total Budget” amount.

****Notice for Tables 1 and 2:** Applicants should follow the exact format of the sample tables for Tables 1 and 2 because the tabular information will be compiled across all proposals. This includes the elements listed below, as applicable to each table. **The applicant should also submit the original Excel files that were used to create the tables, along with updated collaborator templates using the https://science.osti.gov/-/media/grants/excel/Collaborator_Template.xlsx template, via email to QISCenters@science.doe.gov no later than Wednesday, June 11, 2025 at 5 PM Eastern Time. The subject line of the email should read “Centers App Tables:” followed by the Center Director’s last name and the lead institution's name, e.g. “Centers App Tables: Jones, University of XYZ”.** As described in [Section IX.C.3](#), these Excel files should contain, when known, the digital persistent identifiers, including the Open Researcher and Contributor ID (ORCID), of all listed individuals.

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

Table 3: Summary Budget Information by Major Thrust Area (\$ in thousands)

Major Thrust Area	Lead for Major Thrust Area	Year1 Budget	Year2 Budget	Year3 Budget	Year4 Budget	Year5 Budget	Total Budget
Total							

Tables 1- 3 will not count in the proposal page limitation.

The material listed here defines the required content of a title page. Additional material is not allowed.

PROJECT NARRATIVE

The Project Narrative **must not exceed a page limit of 45 pages** of technical information, including charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard letter-size (8.5-inch x 11-inch) paper with 1-inch margins (top, bottom, left, and right). The body text font of all main text must not be smaller than 11-point. Merit reviewers will only consider the number of pages specified in the first sentence of this paragraph. This page limit does not apply to the Title Page, Budget Page(s), Budget Justification, biographical material, publications and references, and appendices, each of which may have its own page limit defined later in this Announcement.

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

All Project Narratives must, at least, include an overview of the Center that provides a concise summary of the vision and a section for each of the six essential components as described in Section I. These sections should contain background material, specific objectives, methods to be used, and metrics to evaluate the Center’s impact. The six essential components that must be incorporated in each Center are:

- S&T Innovation Chain and Co-Design
- Technical Areas of Interest – topics and subtopics
- The one-to-three large-scale, focused efforts that define the majority of the center’s work
- QIS Ecosystem Stewardship

- Management Structure (A brief overview of the data management plan and the IP plan should be included here however the details should be addressed in Appendices 7 and 10, respectively.)
- Instrumentation and Facilities (A brief overview of the plan for using, developing and accessing instrumentation, facilities and related capabilities should be included here however details about specific resources should be addressed in Appendices 5, 6 and 10.)

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

APPENDIX 1: BIOGRAPHICAL SKETCH

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

- Provide the biographical sketch information as an appendix to your Project Narrative.
- Do not attach a separate file.
- The biographical sketch appendix will not count in the Project Narrative page limitation.

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

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

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

APPENDIX 2: SYNERGISTIC ACTIVITIES (OPTIONAL)

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

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

APPENDIX 3: CURRENT AND PENDING SUPPORT

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

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

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

APPENDIX 4: BIBLIOGRAPHY & REFERENCES CITED

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

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

APPENDIX 5: FACILITIES & OTHER RESOURCES

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

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

APPENDIX 6: EQUIPMENT

List major items of equipment already available for this project and, if appropriate identify

location and pertinent capabilities. Provide the Equipment information as an appendix to your Project Narrative.

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

APPENDIX 7: DATA MANAGEMENT PLAN

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

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

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

In addition, the DMP must specifically address:

- How a public-facing Center web-site will be developed and maintained.
- How FAIR (Findable, Accessible, Interoperable, and Reusable)¹² principles will apply to the anticipated data sets, software¹³, and models¹⁴ to be developed.
- What developed software, data sets, and models that constitute major thrust deliverables will be made available using an “open source” licensing arrangement, noting the Software Package Data Exchange (SPDX) identifier(s) (<https://spdx.org/licenses/>) when possible, and where deviation in this arrangement is expected from The Open Source Initiative’s “Open Source Definition” (<https://opensource.org/osd>), a specific justification must be provided.
- How best practices in scientific software development will be applied to any development activities. For more information on best practices, see Better Scientific Software (<https://bssw.io/>).

APPENDIX 8: ORGANIZATIONAL LETTERS OF COMMITMENT

A single organizational letter of commitment is required from each organization participating as a Center member. Each organizational letter of commitment is limited to one page and must be current, signed, and dated by a person authorized to commit the participating organization to a legally binding agreement for this project.

- Do not attach a separate file.

¹² Wilkinson, M. D. et al. The FAIR Guiding Principles for Scientific Data Management and Stewardship. *Sci. Data* 3:160018, 2016. <https://doi.org/10.1038/sdata.2016.18>

¹³ Chue Hong, N. P., Katz, D. S., Barker, M., Lamprecht, A-L, Martinez, C., Psoomopoulos, F. E., Harrow, J., Castro, L. J., Gruenpeter, M., Martinez, P. A., Honeyman, T., et al. (2022). FAIR Principles for Research Software version 1.0. (FAIR4RS Principles v1.0). Research Data Alliance. DOI: <https://doi.org/10.15497/RDA00068>

¹⁴ Ravi, N., Chaturvedi, P., Huerta, E.A. et al. FAIR principles for AI models with a practical application for accelerated high energy diffraction microscopy. *Sci Data* 9, 657 (2022). <https://doi.org/10.1038/s41597-022-01712-9>

- This appendix will not count in the Project Narrative page limitation.

APPENDIX 9: INTELLECTUAL PROPERTY (IP) MANAGEMENT PLAN

Discuss Each Center should include within their proposal a proposed IP Management Plan that ensures and facilitates compliance with Federal IP laws and policies, the public interest regarding dissemination of scientific reports/results, and the rapid transfer of technology in the topical area of the Center.

The plan should also describe how the Center will share data and other software tools to create an innovative ecosystem within the Center and with external stakeholders The plan should address title to inventions and other IP among the Center members and should at minimum cover:

- Sharing of information and treatment of confidential information among the Center and Center members (e.g., the use of NDAs);
- The treatment of background intellectual property (e.g., any requirements for identifying it or making it available);
- The treatment of Technical Areas of Interest as set forth in Section 1 of this FOA, ensuring that Center members have sufficient intellectual property rights to further develop and bring the technologies to market.
- The treatment of inventions made under the award (e.g., any requirements for disclosing to the other members, attribution on patent applications, filing patent applications, paying for patent prosecution, and cross-licensing or other licensing arrangements between the members);
- The treatment of data produced, including software, under the award (e.g., any publication process or other dissemination strategies, copyrighting strategy or licensing arrangement among members);
- Any technology transfer and commercialization requirements or arrangements among the members;
- The treatment of any intellectual property issues that may arise due to a change in Center membership; and
- The handling of disputes related to intellectual property between members.
- Do not attach a separate file.
- This appendix will not count in the Project Narrative page limitation.

APPENDIX 10: QIS CENTER INFRASTRUCTURE PLAN

Discuss the plans for locating the proposed Center. This includes identification of the site or sites where the major activities of the Center will take place and how the site(s) will be acquired (use of space provided by the host institution(s), leased space, or combinations of these and other options) and prepared for use by the Center. The Center site, acquisition, design and development plan should describe the proposed size, conceptual layout, and development strategy (including summary-level scope, schedule and cost estimates including alteration and/or renovations for the space, i.e., the estimated cost to build out the space) for the space needed to

house and support the research program identified in the narrative.

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

APPENDIX 11: ADDITIONAL INSTITUTIONAL COMMITMENT

Discuss any additional contributions to the proposed Center, and the source of the contributions, institutional or third party, foreign or domestic, including, but not limited to:

- The provision of space, facilities, equipment, or resources at no or reduced charge;
- The provision of release time for faculty;
- The provision of scholarship support for students; or
- The waiver of facilities and administrative costs, in whole or in part.
- Third party contributions (e.g., state, private entities, etc.)

Institutional commitments may not include the following:

- Revenues or royalties from the prospective operation of an activity beyond the time considered in the award;
- Proceeds from the prospective sale of an asset of an activity; or
- Other Federal awards.

Any institutional commitment will be between the Center and its team member(s).

You must provide a letter from the institution stating that it is committed to providing a specific contribution. The letter should also identify the proposed type of contribution. Letters must be signed by a person authorized to commit the organization to the contribution and are limited to one-page. If there are no additional institutional commitments, this must be indicated in this appendix.

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

APPENDIX 12: PROJECT TIMETABLE

This section should outline as a function of time, year by year, all the major activities or phases, deliverables and benchmarks. The successful applicant will be expected to employ standard project management discipline and must use this project timetable to report progress.

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

APPENDIX 13: DOE/NNSA NATIONAL LABORATORY RENEWALS

If a DOE/NNSA National Laboratory submits a proposal that seeks to extend the performance of current work being done at the Laboratory, provide a detailed listing of all publications and other products derived from the current work. The listing may be provided in any scholarly bibliographic format. The listing may be augmented by a narrative description highlighting current research achievements.

- Do not attach a separate file.
- There is no page limit for the list of publications and other products, however, any augmenting narrative description should not exceed a page limit of 3 pages when printed using standard letter-size (8.5 -inch x 11-inch) paper with 1-inch margins (top, bottom, left, and right)
- This appendix will not count in the Project Narrative page limitation

APPENDIX 14: OTHER ATTACHMENTS (OPTIONAL)

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

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

5. Collaborator Information

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

V. Submission Requirements and Deadlines

A. Address to Request Proposal Package

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

Proposals submitted outside of PAMS will not be accepted.

B. Submission Instructions

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

D. Submission Dates and Times

1. Letter of Intent Due Date

Not applicable

2. Pre-proposal Due Date

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

You are encouraged to submit your pre-proposal well before the deadline. Pre-proposals may be submitted at any time between the publication of this Announcement and the stated deadline.

3. Proposal Due Date

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

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

4. Late Submissions

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

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

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

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

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

Additionally, if a clerical error by administrative staff results in an incomplete submission of a letter of intent, pre-proposal, or proposal, an authorized institutional official may appeal to correct its error by emailing QISCenters@science.doe.gov within 48 business hours of the deadline. This grant of leniency is at DOE's sole discretion.

VI. Proposal Review Information

A. Responsiveness Review

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

B. Review Criteria

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

1. Scientific and/or Technical Merit of the Project

- The extent to which the vision of the proposed Center, and its scientific and technological goals, may advance basic research in QIS and improve the competitiveness of the U.S.
- The extent to which the proposed research and development program is at the forefront of the technical areas pertinent to the Center.
- The impact of the Center's R&D on U.S. science and technology at a national scale, including long-term innovative consequences.
- The balance between high-risk high-reward efforts and solid developments with a stronger likelihood of success.
- Is the Data Management Plan suitable for the proposed research? To what extent does it support the validation of research results? To what extent will research products, including data, be made available and reusable to advance the field of research?
- Does the Data Management Plan address the specific requirements the topic description?

2. Justification for Center-Scale Effort, Including Cohesion and Integration of the Research Activities

- The extent to which the challenge addressed by the Center warrants a large, multi-institutional, multi-disciplinary effort that cuts across multiple programs in SC and requires resources at the proposed scale.
- Does the Center propose no more than three large-scale, focused efforts that define the majority of the Center's work? Do any industry participants play an appropriately significant role in those efforts?
- The extent to which the challenge demands integrated, synergistic collaboration across the institutions and disciplines that comprise the Center, as opposed to a more loosely connected set of smaller projects or researchers working independently.
- The Center's substantial contributions to the mission needs of more than one SC program office, and its integration of elements from multiple technical areas of interest.

- The evidence supporting the proposed approach to create a collaborative, synergistic culture in the Center, such that the participants will deliver the necessary cohesion and integration.

3. Appropriateness of the Proposed Method or Approach

- The effectiveness of the proposal's approach of incorporating essential components to construct the Center as an integrated, synergistic whole that makes a compelling argument for impacts that require the Center-scale investment.
- The extent to which the Center advances both science and technology in its focus area, accelerating progress from discovery to prototypical technology, integrating at least three levels of the S&T innovation chain and using co-design approaches.
- The extent to which the Center leverages other investments in DOE research and facilities and creates synergies, not duplications, with efforts developed by other federal agencies, the private sector, and academia.
- The effectiveness of Center's plans to enable cognizance of industry readiness and technology transfer.
- The appropriateness of the proposed S&T methods and approaches detailed in the proposal, and how likely they are to achieve the stated scientific and technological goals of the Center.
- Does the applicant recognize significant potential problems and consider alternative strategies?
- Is the proposed research aligned with the published priorities identified or incorporated by reference in Section III of this Announcement?
- Does the proposed plan to recruit and retain students and early-stage investigators provide sufficient mentorship?

4. Benchmarks, Deliverables, and Metrics

- The appropriateness and clarity of the Center's proposed benchmarks, milestones, and deliverables for its near-, intermediate-, and long-term goals, particularly in relation to the levels of the innovation chain.
- The appropriateness of the proposed metrics to evaluate the Center's impact and accomplishments, and the evidence to justify these metrics in the context of the Center's mission and goals.
- What clearly defined mechanisms, including flexible roadmapping, does the applicant present to evaluate success/failure, make mid-course corrections, and circumvent obstacles to progress?

5. Strength of the Center Management Plan and QIS Ecosystem Stewardship

- The effectiveness of the Center's management plan that includes: a strong lead organization, a core location, a director and deputy director, a leadership structure with clear roles and responsibilities, and an evidence-based plan for achieving a collaborative and synergistic research culture throughout the Center.
- The effectiveness of the Center's proposed mechanisms for internal communication and coordination.

- The effectiveness of the Center’s proposed coordination and collaboration plans with other potential Centers and other DOE-funded research and facilities programs, as well as outreach activities to catalyze synergies within the overall QIS ecosystem.
- Are the staffing and workforce development plans adequate to attract, nurture and retain the necessary wide range of expertise?
- Are the IP and Data Management Plans suitable for the proposed research? To what extent does the data management plan make the data available and useful to the scientific and technological community?

6. Competency of Applicant’s Personnel and Adequacy of Proposed Resources

- What evidence does the proposal present that the lead organization and the Center Director have proven records of success in program and personnel management of diverse teams of scientific and technical professionals for projects of comparable complexity and magnitude?
- To what extent do the applicant’s senior/key personnel have proven records of research in the disciplines needed for success in this project?
- Do the team members have a strong track record in successful collaboration?
- Is the proposed access to existing research space, instrumentation, and experimental and computational facilities at the lead and partner institutions likely to meet the needs of the proposed Center? If needed, do the applicants articulate plans for access to research capabilities and resources outside of the Center, including national user facilities?

7. Reasonableness and Appropriateness of the Proposed Budget

- Is the requested operating budget and the distribution of the funds among research tasks/themes and partners reasonable for the planned scientific and technological program? Comment on any budget items that are not well justified or appear anomalous.
- Does the budget include adequate support for the appropriate personnel to carry out the proposed research?
- Are the equipment needs adequately identified, and costs for needed new instrumentation or upgrades realistically estimated?
- Are all subcontracts, travel, student costs and other ancillary expenses adequately estimated and justified?
- How does the requested budget relate to the specified management structure?

C. Review and Selection Process

1. Merit Review

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

DOE may, as part of the merit review process, schedule face-to-face meetings between representatives of one or more applicants and merit reviewers to allow merit reviewers to obtain answers to their questions or additional information about the contents of the most meritorious

proposals. Applicants may be required to travel to a designated location for a presentation to the merit reviewers.

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

2. Pre-Selection Interviews

As part of the evaluation and selection process, DOE may invite one or more applicants to participate in Pre-Selection Interviews. Pre-Selection Interviews are distinct from and more formal than pre-selection clarifications (See Section VI.C.3 of the Announcement). The invited applicant(s) will meet with DOE representatives to provide clarification on the contents of the proposals and to provide DOE an opportunity to ask questions regarding the proposed project. The information provided by applicants to DOE through Pre-Selection Interviews contributes to DOE's selection decisions. These interviews may include DOE federal personnel, representatives from other federal agencies and non-federal merit reviewers.

In advance of convening such meetings the DOE Review official will notify those applicants of the meeting and describe in detail the information that may be presented at them. Under no circumstances will the applicants be allowed to revise, enhance, or supplement their original proposal.

DOE will arrange to meet with the invited applicants in person at DOE's offices or a mutually agreed upon location. DOE may also arrange site visits at certain applicants' facilities. In the alternative, DOE may invite certain applicants to participate in a one-on-one conference with DOE via webinar, videoconference, or conference call.

DOE will not reimburse applicants for travel and other expenses relating to the Pre-Selection Interviews, nor will these costs be eligible for reimbursement as pre-award costs.

DOE may obtain additional information through Pre-Selection Interviews that will be used to make a final selection determination. After consideration of information obtained at these meetings, the merit reviewers may refine their evaluation of the strengths and weaknesses of the individual proposals and may revise the final overall adjectival rating. DOE may select proposals for funding and make awards without Pre-Selection Interviews. Participation in Pre-Selection Interviews with DOE does not signify that applicants have been selected for award negotiations.

3. Pre-Selection Clarification

DOE may determine that pre-selection clarifications are necessary from one or more applicants. Pre-selection clarifications are distinct from and less formal than pre-selection interviews. The pre-selection clarifications may occur before, during or after the merit review evaluation process. Information provided by an applicant that is not necessary to address the pre-selection

clarification question will not be reviewed or considered. Typically, a pre-selection clarification will be carried out through either written responses to DOE's written clarification questions or video or conference calls with DOE representatives.

The information provided by applicants to DOE through pre-selection clarifications is incorporated in their proposals and contributes to the merit review evaluation and DOE's selection decisions. If DOE contacts an applicant for pre-selection clarification purposes, it does not signify that the applicant has been selected for negotiation of award or that the applicant is among the top ranked proposals.

DOE will not reimburse applicants for expenses relating to the pre-selection clarifications, nor will these costs be eligible for reimbursement as pre-award costs.

3. 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, and the relationship of the proposed Center to other research programs in DOE
- Potential for developing synergies between the proposed Center and other Centers or other ongoing SC research activities
- Performance under current awards
- Ensuring a distribution of supported researchers at various career stages
- Commitment to sharing the results of research
- Demonstrations of institutional or third-party commitments to the proposed Center
- Strength of impact on U.S. Competitiveness

4. Selection

The Selection Official will consider the findings of the merit review and may consider any of the Program Policy Factors described above. Additionally, DOE reserves, at its sole discretion, the right to require the removal of any proposed team member of a multi-institutional proposal selected for award, based on consideration of Program Policy Factors.

5. Discussions and Award

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

VII. Award Notices

A. Type of Award Instrument

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

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

B. Anticipated Timeline for Notice of Selection for Award Negotiation

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

1. Notice of Selection for Award Negotiation

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

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

2. Notice of Award

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

VIII. Post-Award Requirements and Administration

A. Administrative and Policy Requirements

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

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

B. Reporting

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

IX. Other Information

A. Checklist for Avoiding Common Errors

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

Checklist for Avoiding Common Errors:

Item	Issue
Proposals	Submitted in PAMS. Do not submit proposals in Grants.gov or FedConnect. Do not attempt to submit a proposal unless you are affiliated with a DOE/NNSA National Laboratory.
Pre-Proposals	<ul style="list-style-type: none"> - Submit your pre-proposal in PAMS. - Do not submit your pre-proposal in Grants.gov. - Follow the instructions in Section IV for the preparation of a pre-proposal.
Page Limits	Strictly followed throughout proposal, including particular attention to: <ul style="list-style-type: none"> - Project Narrative - Data Management Plan(s) (DMPs) - Letter(s) of Recommendation, if any
Personally Identifiable Information	None present in the proposal
Project Narrative	Composed of one PDF file including all appendices
Project Summary / Abstract	Name(s) of applicant, PI(s), PI's institutional affiliation(s), Co-Investigator(s), Co-Investigator's institutional affiliation(s)
DOE Title Page	Follow instructions closely
Budget	Use current negotiated indirect cost and fringe benefit rates
Budget Justification (attached to budget)	Justify all requested costs
Biographical Sketches	Follow page limits strictly and do not include list of collaborators.
Current and Pending Support	Ensure complete listing of all activities, regardless of source of funding.
List of Individuals who Should not Serve as Merit Reviews	Provided as separate file in proposal
Data Management Plans (DMP)	<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

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

B. How-To Guides

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

1. How to Distinguish Between a New and Renewal Proposal

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

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

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

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

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

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

2. How Consortia May be Used

INCORPORATED CONSORTIA

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

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

UNINCORPORATED CONSORTIA

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

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

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

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

3. How to Submit Letters of Intent

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

Submit Your Letter of Intent:

- Create your letter of intent outside the system and save it as a file with extension .docx, .doc, or .pdf. Make a note of the location of the file on your computer so you can browse for it later from within PAMS.

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

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

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

4. How to Submit a Pre-Proposal

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

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

Submit Your Pre-Proposals:

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

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

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

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

5. How to Prepare and Submit a Proposal

SUBMITTING A PROPOSAL

The following information is provided to help with proposal submission. Detailed instructions and screen shots can be found in the PAMS Help materials, accessible by clicking the “PAMS Help” link on the PAMS home page. Onscreen instructions are available within PAMS.

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

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

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

PROPOSAL PREPARATION

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

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

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

RESUBMISSION OF PROPOSALS

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

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

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

IMPROPER CONTENTS OF PROPOSALS

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

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

6. How to Prepare a Biographical Sketch

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

SC requires the use of the format approved by the National Science Foundation (NSF), which may be generated by the Science Experts Network Curriculum Vitae (SciENCv), a cooperative venture maintained at <https://www.ncbi.nlm.nih.gov/sciencv/>. The fillable PDFs provided by the National Science Foundation are no longer available. SciENCv has been updated to meet the interagency common format biographical sketches.

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

- **Education and Training:** Undergraduate, graduate and postdoctoral training, provide institution, major/area, degree and year.
- **Research and Professional Experience:** Beginning with the current position, list professional/academic positions in chronological order with a brief description. List all current academic, professional or institutional appointments, foreign or domestic, at the

applicant institution or elsewhere, whether remuneration is received, and, whether full-time, part-time, or voluntary.

- **Publications:** Provide a list of up to 10 publications most closely related to the proposed project. For each publication, identify the names of all authors (in the same sequence in which they appear in the publication), the article title, book or journal title, volume number, page numbers, year of publication, and website address if available electronically. Patents, copyrights and software systems developed may be provided in addition to or substituted for publications. An abbreviated style such as the Physical Review Letters (PRL) convention for citations (list only the first author) may be used for publications with more than 10 authors.

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

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

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

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

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

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

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

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

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

For all identified individuals, provide the following information:

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

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

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

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

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

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

8. How to Prepare Current and Pending Support

<p>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.</p>

Current and Pending support is intended to allow the identification of potential duplication, overcommitment, potential conflicts of interest or commitment, and all other sources of support. The PI and each senior/key person at the prime applicant and any proposed subaward must provide a list of all sponsored activities, awards, and appointments, whether paid or unpaid; provided as a gift with terms or conditions or provided as a gift without terms or conditions; full-

time, part-time, or voluntary; faculty, visiting, adjunct, or honorary; cash or in-kind; foreign or domestic; governmental or private-sector; directly supporting the individual's research or indirectly supporting the individual by supporting students, research staff, space, equipment, or other research expenses. Include the current application and any application submitted to any source of funding in a list of current and pending support. All sources of support must be disclosed, but for work that is subject to government classification or enforceable non-disclosure agreements, the general area of the research should be described without disclosing sensitive details and the sponsor should be listed as "Government Agency" or "private sponsor." All foreign government-sponsored talent recruitment programs must be identified in current and pending support.

SC requires the use of the format approved by the National Science Foundation (NSF), which may be generated by the Science Experts Network Curriculum Vitae (SciENCv), a cooperative venture maintained at <https://www.ncbi.nlm.nih.gov/sciencv/>. The fillable PDFs provided by the National Science Foundation are no longer available. SciENCv has been updated to meet the interagency common format for current and pending support.

For every activity, list the following items:

- The sponsor of the activity or the source of funding.
- The award or other identifying number.
- The title of the award or activity. If the title of the award or activity is not descriptive, add a brief description of the research being performed that would identify any overlaps or synergies with the proposed research.
- The total cost or value of the award or activity, including direct and indirect costs. For pending proposals, provide the total amount of requested funding.
- The award period (start date – end date).
- The person-months of effort per year being dedicated to the award or activity.

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

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

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

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

9. How to Prepare a Data Management Plan

In general, a DMP should address the following requirements:

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

DMPs will be reviewed as part of the overall SC research proposal merit review process.

Applicants are encouraged to consult the SC website for further information and suggestions for how to structure a DMP: <https://science.osti.gov/funding-opportunities/digital-data-management>

10. How to Prepare a Budget and Justification

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

- Funds requested for personnel (senior, key, and other) must be justified as the product of their effort on the project and their institutional base salary.

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

Please provide the total funding requested across all budget fields to support the implementation of the project [PIER Plan](#).

Budget Fields

Section A Senior/Key Person	For each Senior/Key Person, enter the requested information. List personnel, base salary, the number of months that person will be allocated to the project, requested salary, fringe benefits, and the total funds requested for each person. The requested salary must be the product of the base salary and the effort. Include a written narrative in the budget justification that justifies the need for requested personnel. Within the justification, explain the fringe benefit rate used if it is not the standard faculty rate.
Section B Other Personnel	List personnel, the number of months that person will be allocated to the project, requested salary fringe benefits, and the total funds requested for each person. Include a written narrative in the budget justification that fully justifies the need for requested personnel. Within the justification, provide the number of positions being filled in each category of other personnel.
Section C Equipment	For the purpose of this budget, equipment is designated as an item of property that has an acquisition cost of \$5,000 or more and an expected service life of more than one year, unless a different threshold is specified in a negotiated Facilities and Administrative Cost Rate. (Note that this designation applies for proposal budgeting only and differs from the DOE definition of capital equipment.) List each item of equipment separately and justify each in the budget justification section. Do not aggregate items of equipment. Allowable items ordinarily will be limited to research equipment and apparatus not already available for the conduct of the work. General-purpose office equipment is not eligible for support unless primarily or exclusively used in the actual conduct of scientific research.
Section D Travel	For purposes of this section only, travel to Canada or to Mexico is considered domestic travel. In the budget justification, list each trip’s destination, dates, estimated costs including transportation and subsistence, number of staff traveling, the purpose of the travel, and how it relates to the project. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or

	<p>some other basis). To qualify for support, attendance at meetings or conferences must enhance the investigator’s capability to perform the research, plan extensions of it, or disseminate its results. Domestic travel is to be justified separately from foreign travel. Within the budget justification, detail the number of personnel planning to travel and the estimated per-traveler cost for each trip.</p>
<p>Section E Participant/Trainee Support Costs</p>	<p>If applicable, submit training support costs. Educational projects that intend to support trainees (precollege, college, graduate and post graduate) must list each trainee cost that includes stipend levels and amounts, cost of tuition for each trainee, cost of any travel (provide the same information as needed under the regular travel category), and costs for any related training expenses. Participant costs are those costs associated with conferences, workshops, symposia or institutes and breakout items should indicate the number of participants, cost for each participant, purpose of the conference, dates and places of meetings and any related administrative expenses.</p> <p>Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis).</p>
<p>Section F Other Direct Costs</p>	<ul style="list-style-type: none"> • Materials and Supplies: Enter total funds requested for materials and supplies in the appropriate fields. In the budget justification, indicate general categories such as glassware, and chemicals, including an amount for each category (items not identified under “Equipment”). Categories less than \$1,000 are not required to be itemized. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). • Publication Costs: Enter the total publication funds requested. The proposal budget may request funds for the costs of documenting, preparing, publishing or otherwise making available to others the findings and products of the work conducted under the award. In the budget justification, include supporting information. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). • Consultant Services: Enter total funds requested for all consultant services. In the budget justification, identify each consultant, the services he/she will perform, total number of days, travel costs, and total estimated costs. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). • ADP/Computer Services: Enter total funds requested for ADP/Computer Services. The cost of computer services, including computer-based retrieval of scientific, technical and education information may be requested. In the budget justification, include the established computer service rates at the proposing organization if applicable. Indicate the basis for the

	<p>cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis).</p> <ul style="list-style-type: none"> • Subawards/Consortium/Contractual Costs: Enter total costs for all subawards/consortium organizations and other contractual costs proposed for the project. In the budget justification, justify the details. • Equipment or Facility Rental/User Fees: Enter total funds requested for Equipment or Facility Rental/User Fees. In the budget justification, identify each rental/user fee and justify. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). • Alterations and Renovations: Enter total funds requested for Alterations and Renovations. In the budget justification, itemize by category and justify the costs of alterations and renovations, including repairs, painting, removal or installation of partitions, shielding, or air conditioning. Where applicable, provide the square footage and costs. • Other: Add text to describe any other Direct Costs not requested above. Enter costs associated with “Other” item(s). Use the budget justification to further itemize and justify.
Section G Direct Costs	This represents Total Direct Costs (Sections A through F). PAMS will automatically calculate this.
Section H Other Indirect Costs	Enter the Indirect Cost information, including the rates and bases being used, for each field. Only four general categories of indirect costs are allowed/requested on this form, so please consolidate if needed. Include the cognizant Federal agency and contact information if using a negotiated rate agreement. Within the budget justification, explain the use of multiple rates, if multiple rates are used.
Section I Total Direct and Indirect Costs	This is the total of Sections G and H. PAMS will automatically calculate this.

11. How to Register in PAMS

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

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

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

CREATE PAMS ACCOUNT:

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

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

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

REGISTER TO YOUR INSTITUTION:

5. 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.)
6. PAMS will take you to the “Register to Institution” page.
7. 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.)
8. 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.
9. 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.
10. If, after searching, you think your institution is not currently in the database, click the “Cannot Find My Institution” button and enter the requested institution information into PAMS. Click the “Create Institution” button. PAMS will add the institution to the system, associate your profile with the new institution, and return you to the “Institutions – List” page when you are finished.

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

12. How to View Proposals in PAMS

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

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

C. Administrative and Policy Requirements

1. Availability of Funds

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

2. Commitment of Public Funds

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

3. Digital Persistent Identifier (PID)

Covered individuals¹⁵ listed on proposals must provide a digital persistent identifier (PID) in the common Biographical Sketch and Current and Pending (Other) Support forms as part of the proposal. Included PIDs must meet the common/core standards specified in the [NSPM-33](#)

¹⁵ Covered Individual means an individual who (a) contributes in a substantive, meaningful way to the development or execution of the scope of work of a project funded by DOE or proposed for funding by DOE, and (b) is designated as a covered individual by DOE.

DOE designates as covered individuals any principal investigator (PI); project director (PD); co-principal investigator (Co-PI); co-project director (Co-PD); project manager; and any individual regardless of title that is functionally performing as a PI, PD, Co-PI, Co-PD, or project manager. Status as a consultant, graduate (master’s or PhD) student, or postdoctoral associate does not automatically disqualify a person from being designated as a “covered individual” if they meet the definition above.

[Implementation Guidance](#) or successor guidance (e.g., an [ORCID iD](#)). The inclusion of an individual's PID will be optional until May 1, 2025, and mandatory thereafter.

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

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

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

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

5. Evaluation and Administration by Non-Federal Personnel

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

6. Federal, State, and Local Requirements

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

7. Funding Restrictions

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

8. Government Right to Reject or Negotiate

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

9. Modification

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

10. PDF Generation

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

11. Proprietary Proposal Information

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

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

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

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

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

Notice of Restriction on Disclosure and Use of Data:

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

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

IMPORTANT GUIDANCE FOR COMPANY SUBMITTERS:

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

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

12. Publications

Researchers are expected to publish or otherwise make publicly available the results of the work conducted under any authorization resulting from this Announcement. Publications and other

methods of public communication describing any work based on or developed under an authorization resulting from this Announcement must contain an acknowledgment of SC support. The format for such acknowledgments is provided at <https://science.osti.gov/funding-opportunities/acknowledgements/>. The author's copy of any peer-reviewed manuscript accepted for funding must be announced to DOE's Office of Scientific and Technical Information (OSTI) and made publicly available in accordance with the Laboratory's contract.

14. Updating Your PAMS Profile

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