

**FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT**



U. S. Department of Energy

**Office of Science
High Energy Physics**

FY 2018 Research Opportunities in High Energy Physics

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IMPORTANT UPDATES AND REMINDERS

REGULATIONS

This Funding Opportunity Announcement (FOA) and any awards made under it are controlled by 2 CFR 200, the Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards, as modified by 2 CFR 910, the Department of Energy Financial Assistance Rules, and 10 CFR 605, the Office of Science Financial Assistance Program.

RENEWAL APPLICATIONS

The Principal Investigator for any application submitted for a renewal (an addition of a project period) of an existing award will be required to submit a Renewal Proposal Products section through the Office of Science's PAMS website at <https://pamspublic.science.energy.gov>. The submitted product list will be sent for merit review as part of the application. The application will not be considered complete and cannot be sent for review until the product list has been submitted.

DATA MANAGEMENT PLAN

The Office of Science (SC) of the U.S. Department of Energy (DOE) has published a new Statement on Digital Data Management (DMP) at <http://science.energy.gov/funding-opportunities/digital-data-management/>, which governs all applications submitted under this FOA and is detailed in Section IV of this FOA. The DMP(s) in an application must address these guidelines for each HEP research thrust where support is being requested.

ACKNOWLEDGMENT OF FEDERAL SUPPORT

The Office of Science published guidance about how its support should be acknowledged at <http://science.energy.gov/funding-opportunities/acknowledgements/>.

REPORTING

The Office of Science has implemented the federal-wide Research Performance Progress Report (RPPR) through the Portfolio Analysis and Management System (PAMS). The common RPPR format is described at <http://www.nsf.gov/bfa/dias/policy/rpprt/>. Progress Reports are generally due 90 days before the end of each budget period. The Principal Investigator (PI) will receive an automated email from PAMS (PAMS.Autoreply@science.doe.gov) 30 days prior to the progress report due date. Some information will be prepopulated. Additional details and changes will be contained in the Reporting Requirements Checklist attached to the Assistance Agreement.

AVOIDING ERRORS

The following advice is compiled from the experiences of applicants for Office of Science financial assistance awards.

- Please ensure that the research narrative is comprised of one and only one PDF file, including all appendices, when it is attached to the SF-424 (R&R) form.
- Please ensure that the budget is calculated using the applicable negotiated indirect cost and fringe benefit rates.
- When using the Office of Science PAMS website at <https://pamspublic.science.energy.gov>, please avoid using the back-arrow button in your web browser to navigate.
- Please ensure that the application contains no sensitive personally identifiable information (PII), such as a Social Security Number, date of birth, or city of birth. Pay particular attention to the content of biographical sketches and curriculum vitae.

In addition, the HEP Program advises applicants that:

- The proposed research scope must be aligned with programmatic priorities of the High Energy Physics (HEP) program.
- A Data Management Plan (DMP) is required for each and every research thrust (e.g., ATLAS, LSST, DUNE, lattice gauge theory, etc.), and must appear in Appendix 8 of the application. The content of the DMP will be considered as part of one of the merit review criteria discussed in Section IV of this FOA. For applications requesting support in an experimental research thrust, references may be given to an experiment's DMP, but if so, the DMP in the proposal must clearly state how the proposed work and its data relate to the corresponding experiment. Any data, including simulations or theoretical work (e.g., points in a plot generated by the proposed research), must be covered by the DMP. A completely data-free research program still requires a DMP stating that no data will be generated and must explain the reasons based on the scope of research that is described in the project narrative. All DMPs must comply with the page limit requirements specified in Section IV of this FOA.
- The Project Summary/Abstract Page must contain the name(s) of the applicant, the project director/principal investigator(s) (PD/PI) and the PD/PI's institutional affiliation, and any Co-Investigators and their institutional affiliations.
- Each HEP research subprogram (e.g., Energy, Theory) for which funding is requested must be listed on the DOE Cover Page. If there is more than one, be sure to attach the Cover Page Supplement.
- Page limits for each section must be strictly followed.
- Biographical sketches must carefully follow the FOA instructions and avoid PII.
- Current and pending support information must be filled out completely, including a brief abstract of the scope of work.
- If any investigator requests support for two or more HEP research subprograms, then in addition to the budget information for the full proposal, separate budget and budget justification narratives for each HEP research subprogram in the proposal for each year in which funding is being requested and for the cumulative funding period must be provided in Appendix 7. Be sure that base salary, effort, and salary request give consistent numbers.
- Level of effort tables, for each person for whom funding is requested in a research thrust, on the scope of activities during the proposed project period, must be included in the budget justifications in Appendix 7.

- Applications that do not comply with the requirements of this FOA may be declined without review.

RECOMMENDATIONS

The Office of Science encourages you to register in all systems as soon as possible. You are also encouraged to submit letters of intent and applications well before the deadline. Further, all senior investigators are strongly recommended to work with their institution's Sponsored Research or Sponsored Program Office to ensure the application is compliant prior to its submission.

ADDITIONAL QUESTIONS

HEP will compile a list of frequently asked questions (FAQs) for this FOA, which will be available at: <https://science.energy.gov/hep/funding-opportunities/>. Applicants are encouraged to consult the FAQ for further information, suggestions, and HEP-specific guidance when preparing and submitting applications to this FOA.

If there are any questions regarding the FOA guidelines and requirements that are not contained in the FAQ, please contact the Program Review Contact and/or the Technical/Scientific Program Contact listed in Section I, well in advance of your application submission.

Section I – FUNDING OPPORTUNITY DESCRIPTION

GENERAL INQUIRIES ABOUT THIS FOA SHOULD BE DIRECTED TO:

Administrative Contact:

Questions about non-technical matters including program rules may be sent to:
sc.hepfoa@science.doe.gov

Technical/Scientific Program Contact:

Questions regarding the specific program areas/technical requirements may be directed to the technical contacts listed below for each subprogram within the FOA.

Program Review Contact:

Questions regarding the program review process for this FOA may be directed to Dr. Abid Patwa, 301-903-0408, abid.patwa@science.doe.gov

STATUTORY AUTHORITY

Public Law 95-91, U.S. Department of Energy Organization Act
Public Law 109-58, Energy Policy Act of 2005

APPLICABLE REGULATIONS

Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards, codified at 2 CFR 200
U.S. Department of Energy Financial Assistance Rules, codified at 2 CFR 910
U.S. Department of Energy, Office of Science Financial Assistance Program Rule, codified at 10 CFR 605

SUMMARY

The High Energy Physics (HEP) program at the U.S. Department of Energy, Office of Science, hereby invites new and renewal grant applications for support of research programs in High Energy Physics.

SUPPLEMENTARY INFORMATION

The following program descriptions are offered to provide more in-depth information on scientific and technical areas of interest to HEP:

Program Website: <http://science.energy.gov/hep/>

The mission of the HEP program is to understand how the universe works at its most

fundamental level, which is done by discovering the elementary constituents of matter and energy, probing the interactions between them, and exploring the basic nature of space and time.

The scientific objectives and priorities for the field recommended by the High Energy Physics Advisory Panel (HEPAP) are detailed in its recent long-range strategic Particle Physics Project Prioritization Plan (P5), available at: http://science.energy.gov/~media/hep/hepap/pdf/May-2014/FINAL_P5_Report_Interactive_060214.pdf

The HEP program focuses on three experimental scientific frontiers:

The Energy Frontier, where powerful accelerators are used to create new particles, reveal their interactions, and investigate fundamental forces;

The Intensity Frontier, where intense particle beams and highly sensitive detectors are used to pursue alternate pathways to investigate fundamental forces and particle interactions by studying events that occur rarely in nature, and to provide precision measurements of these phenomena; and

The Cosmic Frontier, where non-accelerator-based experiments observe the cosmos and detect cosmic particles, making measurements of natural phenomena that can provide information about the nature of dark matter, dark energy, and other fundamental properties of the universe that impact our understanding of matter and energy.

Together, these three interrelated and complementary discovery frontiers offer the opportunity to answer some of the most basic questions about the world around us. Also integral to the mission of HEP are three cross-cutting research areas that enable new scientific opportunities by developing the necessary tools and methods for discoveries:

Theoretical High Energy Physics, where the vision and mathematical framework for understanding and extending the knowledge of particles, forces, space-time, and the universe are developed;

Accelerator Science and Technology Research and Development, where the technologies and basic science needed to design, build, and operate the accelerator facilities essential for making new discoveries are developed; and

Detector Research and Development, where the basic science and technologies needed to design and build the High Energy Physics detectors essential for making new discoveries are developed.

The three frontiers and the three cross-cutting research areas are collectively the six research subprograms supported by HEP. All applications should address specific research goals in one or more of the six research subprograms (as in the examples given below), explain how the proposed research or technology development supports the broad scientific objectives and mission of the HEP program, and aligns with its priorities. Applications where the investigator is proposing to conduct research across multiple HEP research subprograms during the project

period will be considered. For such efforts, the investigator is encouraged to submit only one application that describes the overall research activity, including the fractional time planned in each subprogram (including a level of effort table), and the timeline for any transitions of effort (as appropriate), to allow reviewers to assess the full scope, relevance and impact of the proposed research in the merit review process.

Additional information about the HEP research subprogram areas described above, and in areas (a) through (f) given below, may be found at <https://science.energy.gov/hep/research/>. Each of the research frontiers is described with a list of currently-supported experiments and facilities. Experiments, facilities, theoretical topics, subjects of research, and multi-institutional cooperative endeavors, in which scientific research is carried out, are referred to as “research thrusts” in this FOA and in the HEP-supported research community. Note that HEP makes no commitment to the future support of currently-supported activities: scientific research is a rapidly-changing activity. If you would like to discuss the possible alignment of your research interests with HEP’s frontiers and cross-cutting areas, please direct your inquiries to one of the technical contacts listed below.

Applications that are not in direct support of HEP research (e.g., conferences, experimental operations, conceptual research and development (R&D), design, or fabrication directed towards a specific project, etc.) must not be submitted in response to this Funding Opportunity Announcement. They may be submitted to the annual Office of Science Funding Opportunity Announcement [DE-FOA-0001664], available at www.grants.gov, or to other applicable Office of Science Funding Opportunity Announcements published at www.grants.gov.

Applications submitted to the HEP FOA for support of generic detector R&D efforts should be directed to the Detector Research and Development subprogram research area described below. However, applicants proposing physics studies and pre-conceptual R&D efforts directed towards a specific experiment within an experimental frontier should submit their application to the relevant HEP scientific frontier subprogram research area. Applications for support of accelerator science and technology R&D efforts which are focused specifically on accelerator-based applications outside of HEP are not within the scope of this FOA, and applicants are directed to the Accelerator Stewardship program.

HEP Research Subprogram Areas:

(a) Experimental Research at the Energy Frontier in High Energy Physics

Technical Contact: Abid Patwa, 301-903-0408, abid.patwa@science.doe.gov

This research area seeks to support studies of fundamental particles and their interactions using proton-(anti)proton collisions at the highest possible energies. This is accomplished through direct detection of new phenomena or through sensitive measurements that probe the Standard Model and new physics beyond it. In particular, applications are sought for physics research utilizing data being collected at the Large Hadron Collider (LHC) by the ATLAS and CMS experiments. This research area also provides graduate and postdoctoral research training for the next generation of scientists, and equipment and computational support for physics research activities. Applications addressing physics studies and pre-conceptual R&D directed towards

specific future Energy Frontier experiments are also accepted. Support for Heavy Ion Physics research is not provided under this research area.

(b) Experimental Research at the Intensity Frontier in High Energy Physics

Technical Contact: Glen Crawford, 301-903-4829, glen.crawford@science.doe.gov

This research area seeks to support precision studies that are sensitive to new physical processes at very high energy scales, beyond what can be directly probed with energy frontier colliders, and that often require intense particle beams. This research area includes studies of the fundamental properties of neutrinos produced by a variety of sources, including accelerators and nuclear reactors; studies of rare processes or precision measurements probing new physics processes as described above with either high intensity stored beams or beams incident on fixed targets; and studies of high intensity electron-positron collisions. In addition, this research area includes searches for proton decay. Graduate and postdoctoral research training for the next generation of scientists, and equipment and computational support for physics research activities are also provided. Applications addressing physics studies and pre-conceptual R&D directed towards specific future Intensity Frontier experiments are also accepted. Support for LHCb research or studies of neutrinoless double beta decay is not provided under this research area.

(c) Experimental Research at the Cosmic Frontier in High Energy Physics

Technical Contact: Kathy Turner, 301-903-1759, kathy.turner@science.doe.gov

This research area seeks to support precision studies using observations of the cosmos and naturally occurring cosmic particles to understand the properties of fundamental particles and fields. Priorities include studies of the nature of dark energy, direct-detection searches for dark matter particles and research efforts towards planning the next generation of ground-based cosmic microwave background experiments to explore the inflationary epoch, the nature of dark energy and place constraints on neutrino masses. Measurements using high-energy cosmic rays, gamma rays and other phenomena are included, but at a lower priority. Applications are sought for physics research efforts in support of current experiments in the Cosmic Frontier, as well as physics studies and pre-conceptual planning directed towards specific future experiments being considered for the program. This research area also provides graduate and postdoctoral research training for the next generation of scientists, and equipment and computational support for physics research activities.

Research efforts aimed at developing techniques or understanding experimental data within the context of theoretical models that are expressly for or as part of an experimental research collaboration are included in this area. General theoretical or computational research applications not specifically carried out as part of a particular Cosmic Frontier experimental collaboration should be directed to the Theoretical Research in High Energy Physics subprogram. Studies of gravitational physics (other than for cosmic acceleration), classical astrophysics phenomena, fundamental symmetries, or planning for future cosmic ray or gamma ray experiments are not included in this research area.

(d) Theoretical Research in High Energy Physics

Technical Contact: William Kilgore, 301-903-3711, william.kilgore@science.doe.gov

This research area seeks to support theoretical activities that provide the vision and the mathematical framework for understanding and extending our knowledge of particles, forces, space-time, and the universe. Theoretical research is essential to support current experiments at the Energy, Intensity and Cosmic Frontiers, to identify new directions for High Energy Physics and to provide a deeper understanding of nature. Topics studied in theoretical high energy physics research include but are not limited to: phenomenological studies that seek to interpret experimental data, suggest searches for new physics at existing facilities and develop a research program for future facilities; precision calculations of experimental observables to test our current theories at the level of quantum corrections; the development of new models of physical interactions to describe unexplained phenomena or to unify seemingly distinct concepts; progress in quantum field theory, quantum gravity and other possible frameworks to develop a deeper understanding of nature; and the development of analytical and numerical computational techniques to facilitate studies in these areas. This research area also provides graduate and postdoctoral research training for the next generation of scientists and the computational resources needed for theoretical calculations. Activities that rely on experimental data, performed expressly for or with an experimental research collaboration, are not included in this research area.

(e) Accelerator Science and Technology Research & Development in High Energy Physics
Technical Contact: L.K. Len, 301-903-3233, lk.len@science.doe.gov

The accelerator technology R&D subprogram develops the next generation of particle accelerators and related technologies that are essential for discoveries in HEP. This research area supports world-leading research in the physics of particle beams and long-range, exploratory research aimed at developing new concepts. This research area also provides graduate and postdoctoral research training, equipment for experiments and related computational efforts.

Topics studied in the accelerator science and technology R&D subprogram include, but are not limited to: accelerator and beam physics, including analytic and computational techniques for modeling particle beams and simulation of accelerator systems; novel acceleration concepts; the science of high gradients in accelerating cavities and structures; high-power radio-frequency sources; high-brightness beam sources; and beam instrumentation. Also of interest are superconducting materials and conductor development; innovative magnet design and development of high-field superconducting magnets; as well as associated testing and cryogenic systems. R&D proposals, which are focused on accelerator applications outside of high-energy physics, are now coordinated through the Accelerator Stewardship program and are outside the scope of this particular FOA.

(f) Detector Research and Development in High Energy Physics
Technical Contact: Helmut Marsiske, 301-903-6989, helmut.marsiske@science.doe.gov

The detector R&D subprogram develops the next generation of instrumentation for HEP. It supports research leading to fundamental advances in the science of particle and radiation detection, and the development of new experimental techniques. This is typically long-term, “generic” R&D that is high-risk, but has the potential for wide applicability and/or high-impact.

Proposals for “Blue-Sky” scientific research on innovative technologies not already in contention for implementation in future DOE HEP projects are specifically encouraged.

Topics studied in the detector R&D research area include, but are not limited to: low-mass, high channel density charged particle tracking detectors; high resolution, fast-readout calorimeters and particle identification detectors; techniques for improving the radiation tolerance of particle detectors; detectors for photons from ultraviolet to infrared wavelengths; detectors for cosmic microwave background radiation; detectors and experimental techniques for ultralow-background experiments; and advanced electronics and data acquisition systems. Support for graduate and postdoctoral research training, engineering and other technical efforts, and equipment and computational efforts required for experimental detector R&D and fabrication *is* included in this research area.

APPLICATION REQUIREMENTS

All applications submitted to this FOA must address at least one of the six research subprograms described in the previous section. Further, all applications must conform to the format specified in Section IV of this FOA; each proposal will be pre-screened for responsiveness to the research area descriptions and for compliance with the application requirements.

Section II – AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT

DOE anticipates awarding grants under this FOA.

B. ESTIMATED FUNDING

Research awards are expected to be made typically for a project period of three years at a funding level appropriate for the proposed scope, with out-year support contingent on the availability of funds and satisfactory progress.

It is anticipated that approximately \$20,000,000 will be available for all HEP new and renewal awards under this FOA in FY 2018, at a total estimated cost of \$48,000,000 for the project period of all new and renewal awards under this FOA, subject to the appropriation of funds by the Congress. The number, duration and size of awards will depend on the number of applications selected for award after merit review, and the actual amount of funds available in FY 2018 and future fiscal years.

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

C. MAXIMUM AND MINIMUM AWARD SIZE

Ceiling

\$5,000,000 per year

Floor

\$50,000 per year

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

D. EXPECTED NUMBER OF AWARDS

Approximately 10 to 100 awards are expected.

The anticipated number of awards will depend on the number of meritorious applications, the results of merit review, the program policy factors, and the availability of appropriated funds.

E. ANTICIPATED AWARD SIZE

The anticipated award size will depend on the number of meritorious applications, the results of merit review, the program policy factors, and the availability of appropriated funds.

F. PERIOD OF PERFORMANCE

The anticipated period of performance is expected to average three years with some awards exceeding the average and other awards less than the average, depending on the number of meritorious applications, the results of merit review, the program policy factors, and the availability of appropriated funds.

G. TYPE OF APPLICATION

DOE will accept new and renewal applications under this FOA. The following material will assist in determining if a renewal application is appropriate.

New Application: A new application is appropriate in the following three circumstances:

- An application for funding to create a new research grant that has not previously received DOE funding, including any funding for the current year.
- An application for continued research from the same sponsoring institution as the current grant but with a significant change in scientific research thrust
- An application to continue research performed under an existing DOE grant award but with a new sponsoring institution.
- An application for continued research from the same sponsoring institution as the current grant receiving funds in support of a DOE/SC/HEP award that has an original award date before 2012.

Renewal Application: A renewal application is appropriate when funds are requested for an award that was first awarded in 2012 or later and has no changes in the following items:

- The recipient/applicant institution
- The award's senior leadership
- The research thrust(s)
- The research scope(s)

If an institution is currently receiving funds in support of a DOE/SC/HEP award that has an original award date before 2012, a renewal proposal will not be accepted. In such cases, the institution should submit a new application when applying to this FOA. Applications improperly submitted as renewals may be declined without review.

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

For renewal applications only, the Principal Investigator is required to submit a Renewal Proposal Products section through the Office of Science's PAMS website at <https://pamspublic.science.energy.gov>. The Principal Investigator must enter into PAMS each product created during the course of the previous project period. Types of products include

publications, intellectual property, technologies or techniques, and other products such as databases or software. As soon as the renewal application is assigned to a program manager, the Principal Investigator will receive an automated email from PAMS (PAMS.Autoreply@science.doe.gov) instructing him or her to navigate to the PAMS Task tab to complete and submit the Renewal Proposal Products. The submitted product list will be sent for merit review as part of the application. The application will not be considered complete and cannot be sent for review until the product list has been submitted.

A renewal application must be marked as such on the Standard Form 424 Research and Related [SF-424 (R&R)] cover page and the current award number must be marked in the appropriate space.

If there are any changes in the recipient/applicant institution, the award's senior leadership, the research thrust(s), and/or the research scope(s), the application must be submitted as new.

Section III – ELIGIBILITY INFORMATION

A. ELIGIBLE APPLICANTS

In accordance with 2 CFR 910.126, Competition, eligibility for award is restricted to regionally-accredited domestic institutions of higher education and domestic nonprofit organizations subject to section 501 (c)(3) of the Internal Revenue Code.

A list of the current regional accrediting agencies is maintained by the U.S. Department of Education at <https://ope.ed.gov/accreditation/agencies.aspx>

All applications from regionally-accredited domestic institutions of higher education or domestic nonprofit organizations requesting support for more than one person must propose a Program Director/Principal Investigator who is currently in a tenure-track appointment.

Federally Funded Research and Development Center (FFRDC) Contractors are not eligible to submit applications.

Nonprofit organizations described in section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995, are not eligible to submit applications.

B. COST SHARING

Cost sharing is not required.

C. ELIGIBLE INDIVIDUALS

Individuals with the skills, knowledge, and resources necessary to carry out the proposed research as a Program Director/Principal Investigator are invited to work with their organizations to develop an application for assistance. Individuals from underrepresented groups as well as individuals with disabilities are always encouraged to apply for assistance.

D. PAGE LIMITS

Page limits described in this FOA will be strictly monitored during the initial review of applications. Applications exceeding any page limit will be declined without merit review and will not be considered for funding.

Section IV – APPLICATION AND SUBMISSION INFORMATION

A. ADDRESS TO REQUEST APPLICATION PACKAGE

Application forms and instructions are available at Grants.gov. To access these materials, go to <https://www.grants.gov>, select “Apply for Grants”, and then select “Download Application Package.” Enter the appropriate CFDA number (81.049) and/or the funding opportunity announcement number (DE-FOA-0001781) shown on the cover of this FOA and then follow the prompts to download the application package.

Applications submitted through www.FedConnect.net will not be accepted.

B. LETTER OF INTENT

LETTER OF INTENT – DUE DATE

August 10, 2017, at 5 PM Eastern Time

A Letter of Intent (LOI) is strongly encouraged and should be submitted by the above date by 5 PM Eastern Time. LOIs will not be accepted after this time.

The LOI is to help in planning the merit review process and the selection of potential reviewers for the application. For this purpose, the LOI should include the following:

- A cover sheet with the following information:
 - i. Funding Opportunity Announcement (FOA) Number: DE-FOA-0001781
 - ii. Title of the planned research application
 - iii. Name and mailing address of the sponsoring institution
 - iv. Name of Lead Principal Investigator (PI) and Job Title
 - v. Email address of the Lead PI
 - vi. Additional Senior Investigator(s) and Senior/Key personnel expected to be involved in the planned application
 - vii. Indicate type of application planned: *New or Renewal*
 - viii. Indicate # year(s) for proposal project period for the planned application
 - ix. Research area(s) for the planned application as specified in Section I of this FOA
 - x. Relevant DOE Technical Contact name(s) as listed in Section I of this FOA
- An overview of the research plan **up to 2 pages**. Indicate how the proposed research fits into one or more of the six HEP research subprograms (Energy Frontier, Intensity Frontier, Cosmic Frontier, Theory, Accelerator Science and Technology R&D, or Detector R&D). List the major research thrusts (e.g., ATLAS, CMS, LSST, DUNE, phenomenology, lattice gauge theory, etc.) and the Senior Investigator(s) expected to be involved in the proposed research.

The absence of a LOI will not negatively affect a thorough evaluation of a responsive formal application submitted in a timely fashion.

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

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

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

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 Office of Science merit reviewer or if you have previously submitted an application, you may already be linked to an institution in PAMS. If this happens, you will be taken to the PAMS home page.)

Register to Your Institution:

- Click the link labeled “Option 2: I know my institution and I am here to register to the institution.” (Note: If you previously created a PAMS account but did not register to an institution at that time, you must click the Institutions tab and click the “Register to Institution” link.)
- PAMS will take you to the “Register to Institution” page.
- Type a word or phrase from your institution name in the field labeled, “Institution Name like,” choose the radio button next to the item that best describes your role in the system, and click the “Search” button. A “like” search in PAMS returns results that contain the word or phrase you enter; you do not need to enter the exact name of the institution, but you should enter a word or phrase contained within the institution name. (If your institution has a frequently used acronym, such as ANL for Argonne National Laboratory or UCLA for the Regents of the University of California, Los Angeles, you may find it easiest to search for the acronym under “Institution Name like.” Many institutions with acronyms are listed in PAMS with their acronyms in parentheses after their names.)

- Find your institution in the list that is returned by the search and click the “Actions” link in the Options column next to the institution name to obtain a dropdown list. Select “Add me to this institution” from the dropdown. PAMS will take you to the “Institutions – List” page.
- If you do not see your institution in the initial search results, you can search again by clicking the “Cancel” button, clicking the Option 2 link, and repeating the search.
- If, after searching, you think your institution is not currently in the database, click the “Cannot Find My Institution” button and enter the requested institution information into PAMS. Click the “Create Institution” button. PAMS will add the institution to the system, associate your profile with the new institution, and return you to the “Institutions – List” page when you are finished.

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 / Respond to Funding Opportunity 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 Principal Investigator (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.

For help with PAMS, click the “External User Guide” link on the PAMS website, <https://pamspublic.science.energy.gov/>. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, email: sc.pams-helpdesk@science.doe.gov. All submission and inquiries about this Funding Opportunity Announcement should reference DE-FOA-0001781.

C. CONTENT AND APPLICATION FORMS

BUDGET PRIORITIES AND GUIDANCE

Applicants to this Funding Opportunity Announcement are advised that HEP places primary importance on maximizing the number of research personnel supported by its financial assistance awards. In particular, budgets should be prepared with an effort towards supporting the greatest number of junior scientific personnel consistent with the proposed research scope. During HEP’s decision-making process, such support for junior personnel will be considered a high priority relative to other areas of support.

For all personnel for whom support is requested, the budget must include the proposed effort of that person in person-months, the person’s institutional base salary, the requested cost for fringe benefits, and the total requested cost for each person. The requested salary cost must be the product of the proposed effort and the institutional base salary (e.g., for a university employee with a 12-month salary basis, a person committing 1.2 person-months of effort and having an institutional base salary of \$85,000 may request salary support of \$8,500). Any proposed voluntary effort commitments should be described in the budget justification or in the research narrative, but not on the actual budget form since said contributions are not mandatory and, therefore, will not be formally recognized by DOE.

HEP may recommend downward adjustments to the budgets contained in the applications based on funds available. HEP may reduce support for Principal Investigators (PIs), co-PIs, and/or co-Investigators (co-Is) prior to considering any reduction in support for postdocs or graduate students. Any recommended reduction in support will be made through a reduction in the supported level of effort with an attendant reduction in cost.

Such recommendations for reductions or adjustments will be communicated to applicants during the selection and recommendation process in writing from HEP. A revised budget conforming to any reductions or adjustments will be requested through the PAMS at <https://pamspublic.science.energy.gov/>.

RECURRING SUBMISSIONS OF RESEARCH APPLICATIONS

DOE strongly encourages applicants that were not previously selected for an award, as a result of the application review process, to address any deficiencies identified by the process, and therefore, make necessary modifications to the proposed research narrative or scope. A previously declined application may be resubmitted to this FOA, but only after it has undergone substantial revision. An application submitted to this FOA that has not clearly taken into account the major concerns from prior DOE reviews may be declined without review and will not be considered for funding. The Department will treat the revised proposal as a new application, subject to the standard review procedures.

APPLICATION PREPARATION

You must download the application package, application forms and instructions, from Grants.gov at <https://www.grants.gov/>. (Additional instructions are provided in [Section IV, Part C](#) of this FOA.)

You are required to use the compatible version of Adobe Reader software to complete a [Grants.gov](#) Adobe application package. To ensure you have the [Grants.gov](#) compatible version of Adobe Reader, visit <https://www.grants.gov/web/grants/applicants/adobe-software-compatibility.html>

You must complete the mandatory forms and any applicable optional forms (e.g., Disclosure of Lobbying Activities (SF-LLL)) in accordance with the instructions on the forms and the additional instructions below.

Files that are attached to the forms must be in Adobe Portable Document Format (PDF) unless otherwise specified in this announcement. Attached PDF files must be plain files consisting of text, numbers, and images without editable fields, signatures, passwords, redactions, or other advanced features available in some PDF-compatible software. Do not use PDF portfolios or binders.

Please note: you may only use the following UTF-8 characters when naming your application attachments: A-Z, a-z, 0-9, underscore (_), hyphen (-), space, period. You must limit the file name to 50 or fewer characters. Attachments that do not follow this rule may cause the entire application to be rejected or cause issues during processing.

RENEWAL APPLICATIONS

For renewal applications only, the Principal Investigator is required to submit a Renewal Proposal Products section through the Office of Science's PAMS website at <https://pamspublic.science.energy.gov>. The Principal Investigator must enter into PAMS each product created during the course of the previous project period. Types of products include publications, intellectual property, technologies or techniques, and other products such as databases or software. As soon as the renewal application is assigned to a program manager, the Principal Investigator will receive an automated email from PAMS (PAMS.Autoreply@science.doe.gov) instructing him or her to navigate to the PAMS Task tab to complete and submit the Renewal Proposal Products. The submitted product list will be sent for

merit review as part of the application. The application will not be considered complete and cannot be sent for review until the product list has been submitted.

1. SF-424 (R&R)

Complete this form first to populate data in other forms. Complete all the required fields in accordance with the pop-up instructions on the form. The list of certifications and assurances referenced in Field 17 is available on the DOE Financial Assistance Forms Page at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms> under Certifications and Assurances.

DUNS AND EIN NUMBERS (FIELDS 5 AND 6)

The DUNS and EIN number fields on the SF-424 (R&R) form are used in PAMS to confirm the identity of the individual or organization submitting an application.

- Enter each number as a nine-digit number.
- Do not use hyphens or dashes.
- The Office of Science does not use the twelve-digit EIN format required by some other agencies.

TYPE OF APPLICATION (FIELD 8)

A **new** application is one in which DOE support for the proposed research is being requested for the first time. A **renewal** application requests additional funding for a period of time following a current award. If the application requests a significant change in the scope of work, please consult with the Program contact identified in this FOA to determine if the application should be considered new or a renewal. Please see the additional definitions in Section II, G., Type of Application, beginning on page 11 for additional guidance.

The Office of Science does not make use of the Continuation or Revision options.

Please answer “yes” to the question “Is this application being submitted to other agencies?” if substantially similar, identical, or closely related research objectives are being submitted to another Federal agency. Indicate the agency or agencies to which the similar objectives have been submitted.

2. Research and Related Other Project Information

Complete questions 1 through 6 in the “RESEARCH & RELATED Other Project Information” form.

The following six questions must be answered:

1. Are Human Subjects Involved?
2. Are Vertebrate Animals Used?
3. Is proprietary/privileged information included in the application?
4. Does this project have an actual or potential impact on the environment?

5. Is the research performance site designated, or eligible to be designated, as a historic place?
6. Does this project involve activities outside of the United States or partnership with international collaborators?

NOTE CONCERNING QUESTION 4.A AND 4.B

If any environmental impact, positive or negative, is anticipated, indicate “yes” in response to question 4.a., “potential impact – positive or negative - on the environment.” Disclosure of the impact should be provided in response to question 4.b. First indicate whether the impact is positive or negative and then identify the area of concern (e.g., air, water, exposure to radiation, etc.). Should the applicant have any uncertainty, they should check “yes.”

DOE understands the phrase in field 4.a., “potential impact ... negative” to apply if the work described in the application could potentially have any of the impacts listed in (1) through (5) of 10 CFR 1021, Appendix B, Conditions that Are Integral Elements of the Classes of Action in Appendix B. (<http://www.ecfr.gov>)

Additionally, for actions which could have any other adverse impacts to the environment or have any possibility for adverse impacts to human health (e.g., use of human subjects, Biosafety Level 3-4 laboratory construction/operation, manufacture or use of certain nanoscale materials which are known to impact human health, or any activities involving transuranic or high level radioactive waste, or use of or exposure to any radioactive materials beyond de minimis levels), applicants should indicate a “negative” impact on the environment.

Lastly, 1) if there would be extraordinary circumstances (i.e., scientific or public controversy) related to the significance of environmental effects (10 CFR 1021.410 (b)(2)), 2) if the work is connected to other actions with potentially significant impacts (10 CFR 1021.410 (b)(3), or 3) if the work is related to other nearby actions with the potential for cumulatively significant impacts (10 CFR 1021.410 (b)(3)), applicants should indicate a “negative” impact on the environment.

Further, attach files for the appropriate fields on the Form. The files must comply with the following instructions:

PROJECT SUMMARY/ABSTRACT (FIELD 7 ON THE FORM)

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

Project Title: A Really Great Idea

A. Smith, Lead Institution (Principal Investigator)

A. Brown, Institution 2 (Co-Investigator)

A. Jones, Institution 3 (Co-Investigator)

Abstract

Text of abstract

The project summary **must not exceed 1 page** when printed using standard 8.5” by 11” paper with 1-inch margins (top, bottom, left, and right) with font not smaller than 11 point. To attach a Project Summary/Abstract, click “Add Attachment.”

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

DOE COVER PAGE

(PART OF PROJECT NARRATIVE ATTACHED TO FIELD 8 ON THE FORM)

The application narrative must begin with a cover page that will not count toward the project narrative page limitation. The cover page must include the following items:

- The Project Title:
- Applicant/Institution:
- Applicant Institution City/State/Zip:
- Lead PI name, telephone number, email:
- Administrative Point of Contact name, telephone number, email:
- Funding Opportunity Announcement (FOA) Number: **DE-FOA-0001781**
- DOE/Office of Science Program Office: **High Energy Physics**
- DOE/Office of Science Program Office Technical Contact: SC.HEPFOA@science.doe.gov or the appropriate Technical Contact listed in Section I under the Supplementary Information subsection in this FOA.
- PAMS Letter of Intent tracking number (if applicable):
- DOE Award Number (if Renewal Application):
- HEP research subprogram(s) as identified in Section I of this FOA:

IMPORTANT INSTRUCTIONS TO THE SPONSORED RESEARCH OFFICE OF SUBMITTING INSTITUTIONS

The DOE Office of Science requires that you create one single PDF file that contains the DOE Cover 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 must be attached in Field 8 on the grants.gov form. Do not attach any of the items listed in this paragraph separately in any other field in grants.gov. If you do, these additional attachments will not become part of the application in PAMS.

COVER PAGE SUPPLEMENT FOR PROPOSALS WITH MULTIPLE SUBPROGRAMS OR THRUSTS

(PART OF PROJECT NARRATIVE ATTACHED TO FIELD 8 ON THE FORM)

If the proposal addresses two or more HEP research subprogram(s) (e.g., activities on Energy Frontier, Intensity Frontier, Cosmic Frontier, and/or HEP Theory), and/or research thrusts (e.g., ATLAS, CMS, LSST, DUNE, phenomenology, lattice gauge theory, etc.) provide the following information on a separate page as a supplement to the cover page. This separate supplement page will not count towards the project narrative page limitation.

- List all research subprogram(s) and/or research thrust(s) by name with each Principal Investigator (PI) for the respective research on the same line.
- Indicate the Lead PI who will be the point of contact and coordinator for the combined proposal.
- Include a table modeled on the following chart providing summary budget information for each research subprogram and/or research thrust. Provide the total costs (Direct and Indirect) in the budget request in each funding year for each subprogram or thrust as well as the totals for all rows and columns.
- If necessary, appropriately add rows for additional Co-PI(s), research subprogram(s) and/or research thrust(s).
- PIs should appropriately modify the table below for the correct number of years where a budget is being requested in their application.

Name and Yearly Budget for Proposals with Multiple Research Subprograms or Thrusts						
	Name	Research Subprogram and/or Thrust	Year 1 Budget (\$)	Year 2 Budget (\$)	Year 3 Budget (\$)	Total Budget (\$)
Lead PI						
Co-PI #1						
Co-PI #2						
Co-PI #1						
Co-PI #2						
Co-PI #3						
Co-PI #4						
TOTAL	—	—	Total Year 1	Total Year 2	Total Year 3	Total Y1-3

Example Budget Table (for Proposals with Multiple HEP Research Subprograms or Thrusts)

PROJECT NARRATIVE (FIELD 8 ON THE FORM)

The Project Narrative comprises the research plan for the project. It should contain enough background material in the Introduction, including review of the relevant literature, to demonstrate sufficient knowledge of the state of the science. The major part of the narrative should be devoted to a description and justification of the proposed project, including details of the method to be used. It should also include a timeline for the major activities of the proposed project, and should indicate which project personnel will be responsible for which activities.

The project narrative **must not exceed 9 pages per senior investigator**, including charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard 8.5” by 11” paper with 1-inch margins (top, bottom, left, and right). The font must not be smaller than 11 point.

- For the purposes of calculating the page limit, a senior investigator is considered to be an active tenured or tenure-track faculty member at the sponsoring institution. Non-tenure-track faculty (e.g., research faculty), or senior research staff with term appointments are not included in the page limit of 9 pages per senior investigator unless they are the sole senior investigator on the application. Contributions of non-tenure-track faculty, and/or term research staff to the application may be described in Appendix 2 if applicable (see below).
- Faculty members at collaborating institutions listed on the proposal (if any) are NOT included for the purposes of calculating the page limit.
- As an example, an application with 4 senior investigators cannot exceed 36 pages of research description using the above page and font formatting.
- For each senior investigator, clearly indicate the fraction of total research time during the academic year as well as during the summer that will be spent on the proposed research.
- References needed to cite the research described in the 9 pages per senior investigator narrative can be listed in the Appendix material described below.

Applications exceeding this or any other page limit will be declined without merit review and will not be considered for funding.

Do not include any Internet addresses (URLs) that provide supplementary or additional information that constitutes a part of the application. Using Internet sites in an attempt to avoid page limits will fail: the content of those sites will not be reviewed. References posted to an Internet-based archive or publication are permitted in a list of references. See Section VIII.D. for instructions on how to mark proprietary application information. To attach a Project Narrative, click “Add Attachment.”

The following information will assist in preparing a better narrative:

Background/Introduction: Explanation of the importance and relevance of the proposed work as well as a review of the relevant literature. A brief description of research activities conducted by the Principal Investigator and his/her group, including specific roles and responsibilities in collaborative research efforts, and accomplishments and impacts made during the recent past (typically the past three years), is also encouraged. Investigator(s) proposing to conduct research across multiple HEP research subprograms are encouraged to provide their overall plan for such activities, including any transition of effort.

Common Narrative: Any supporting narrative that is common to all the research areas (e.g., a description of indirect costs or infrastructure) can be included in a separate single section within the narrative. Moreover, an overview of each group’s activities in the different research areas can be provided in order to describe any synergies and connections between the areas. Reviewers will have access to the complete application and will be asked to comment on the adequacies of such synergies and institutional support and/or infrastructure as appropriate to the application.

Multiple Investigators: In applications with more than one senior investigator, the

accomplishments, milestones, and plans of each senior investigator must be clearly identified. Reviewers will be asked to apply the review criterion to the information provided for each senior investigator and these evaluations will be used as input to the funding decisions.

Multiple Research Areas or Thrusts: An application responding to two or more research areas must be structured such that each research area is clearly distinguishable within the application. Each research area within an application will be reviewed independently, and therefore, the research description must be self-contained.

Proposed Research and Methods: Identify the hypotheses to be tested (if any) and details of the methods to be used.

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

Proposed Resources: Identify the resources needed to meet the objectives of the proposed project and accomplish the research goals. Requests for support of any resources in the budgets submitted with the application should be consistent with the scope of research efforts identified in the narrative. Reviewers will be asked to consider if the proposed budgets are reasonable and appropriate to carry out the proposed work and adequately estimated and justified.

Timetable of Activities: This section should outline, year-by-year, all the important activities or phases of the project, including any activities planned beyond the project period. Successful applicants must use this project timetable to report progress.

It is important that the project narrative section provide a complete description of the proposed work. Appendices submitted as Appendix 9: Other Attachment, are optional and merit reviewers are not required to consider the content of Other Attachments when forming their reviews.

Applications exceeding the page limit will be declined without merit review and will not be considered for funding. The page count of 9 pages per senior investigator does not include the Cover Page and Budget Pages, the Title Page, the biographical material and publication information, or any Appendices.

In any section of the project narrative or in the application, it is important not to include any sensitive personally identifiable information (PII) such as a Social Security Number, date of birth, city of birth, citizenship status, home address, etc. Do not include information that a merit reviewer should not make use of.

APPENDICES

Appendices do not count in the project narrative page limitation. They must be appended at the end of the same file as the project narrative – do not attach them as a separate file. All appendices must be included (with the exception of optional Appendix 9), numbered as listed below. If the appendix contents are empty (e.g., no Research Scientist support is requested), include the appendix with text “N/A”.

APPENDIX 1: BIOGRAPHICAL SKETCH – SENIOR INVESTIGATORS

Provide a biographical sketch for the project director/principal investigator (PD/PI) and each senior/key person listed in Section A on the R&R Budget form.

- 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.
- Biographical information (curriculum vitae) specifically for any Research Scientists that may be listed in Section A on the R&R Budget form must follow the guidelines and format described in Appendix 2 below.
- **The biographical information (curriculum vitae) for each person in this appendix must not exceed 2 pages** when printed on 8.5” by 11” paper with 1-inch margins (top, bottom, left, and right) with font not smaller than 11 point. **Applications exceeding this or any other page limit will be declined without review and will not be considered for funding.**
- The biographical information must include the following:

Education and Training: Undergraduate, graduate and postdoctoral training – provide institution, major/area, degree and year.

Research and Professional Experience: Beginning with the current position, list in chronological order professional/academic positions with a brief description.

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

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

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

- **Collaborators and Co-editors:** List in alphabetical order all persons, including their current organizational affiliation, who are, or who have been, collaborators or co-authors with you on a research project, book or book article, report, abstract, or paper during the 48 months preceding the submission of this application. For publications or collaborations with more than 10 authors or participants, only list those individuals in the core group with whom the Principal Investigator interacted on a regular basis while the research was being done. Also, list any individuals who are currently, or have been, co-editors with you on a special issue of a journal, compendium, or conference proceedings during the 24 months preceding the submission of this application. If there are no collaborators or co-editors to report, state “None.”

- **Graduate and Postdoctoral Advisors and Advisees:** List the names and current organizational affiliations of your graduate advisor(s) and principal postdoctoral sponsor(s). Also, list the names and current organizational affiliations of your graduate students and postdoctoral associates.
- **Advisory Committees:** List all advisory committees on which the senior investigator serves, including the name of the institution and department (if applicable).

Personally Identifiable Information (PII): Do not include sensitive personally identifiable information such as a Social Security Number, date of birth, city of birth, citizenship status, home address, etc. Pay particular attention to the content of biographical sketches and curriculum vitae. Do not include information that a merit reviewer should not make use of.

APPENDIX 2: RESEARCH SCIENTISTS (IF APPLICABLE)

Research Scientists are professional personnel above the postdoctoral level that support the research activities of the research program(s) conducted at the academic institution. Research Scientists are individuals that do not have appointments to the tenured or tenure-track instructional faculty but typically have term appointments through the institution. For the purposes of material for this appendix, the Research Scientist(s) are professional scientific personnel not listed as one of the senior investigator(s) in the application.

Provide a supporting narrative for named Research Scientist(s) listed in the proposal. **The narrative in this section of the appendix (hereafter, the “appendix narrative”) must not exceed 2 pages per Research Scientist** when printed using standard 8.5” by 11” paper with 1-inch margins (top, bottom, left, and right). The font must not be smaller than 11 point. **Applications exceeding this or any other page limit will be declined without review and will not be considered for funding.** For each Research Scientist for whom support is requested in the application, the appendix narrative should include brief background information as well as a description of the roles, responsibilities, and scope of research efforts to be conducted by the scientist. The scope should support the research activities described in the project narrative of the application and must follow the guidelines indicated below.

In addition to the appendix narrative, provide a brief biographical sketch for each named Research Scientist(s) listed in the proposal. **The biographical information (curriculum vitae) for each person must not exceed 1 page** when printed on 8.5” by 11” paper with 1-inch margins (top, bottom, left, and right) with font not smaller than 11 point and must follow the guidelines indicated below. **Applications exceeding this or any other page limit will be declined without review and will not be considered for funding.**

Guidelines for Research Scientist Appendix Narrative

Applications must meet the following guidelines when providing the scope of research activities for Research Scientist(s) in their appendix narratives:

- For each, provide the name of the Research Scientist, his/her supervisor, and major research task(s) that s/he will undertake during the project period in the application.
- The appendix narrative is specifically intended to discuss the research scope of Research

Scientist(s) not listed as one of the senior investigator(s), but whose support is requested in the application. The research scope undertaken by the Research Scientist(s) may also be discussed in the main project narrative, and such discussion may be referenced in the appendix narrative as appropriate. However, the appendix narrative must not be used merely to extend the length of the main project narrative of any senior investigator(s) in the proposal. If no support for Research Scientist(s) is requested, then this appendix should be notated “N/A”.

- If the Research Scientist is the sole senior investigator on the application, then the scope of research efforts is already provided in the 9-page main project narrative. Therefore, in these cases, this appendix must not be completed, and should be notated “See Project Narrative”.
- If a Research Scientist’s efforts are listed multiple times in a proposal across different research areas and/or thrusts, any appendix narrative for the particular Research Scientist still must not exceed 2 pages. Therefore, the appendix narrative page limitation is irrespective of the number of activities being described.
- In this appendix, it is important not to include any sensitive personally identifiable information (PII) such as a Social Security Number, date of birth, city of birth, citizenship status, home address, etc. Do not include information that a merit reviewer should not make use of.
- Do not attach a separate file.
- This appendix will not count in the main project narrative page limitation.

Guidelines for Research Scientist Biographical Sketch

The 1-page biographical sketch for each Research Scientist listed in the application must include the following information:

Education and Training: Undergraduate, graduate and postdoctoral training – provide institution, major/area, degree and year.

Research and Professional Experience: Beginning with the current position list, in chronological order, professional/academic positions with a brief description. For experimental research efforts, include the name of the collaboration where the research is conducted.

Publications: Provide a list of up to 5 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. You may use an abbreviated style such as the *Physical Review Letters* (PRL) convention for citations (list only the first author). You may also use this convention in the application bibliography. Patents, copyrights and software systems developed may be provided in addition to or substituted for publications.

Graduate and Postdoctoral Advisors: List the names and current organizational affiliations of your graduate advisor(s) and principal postdoctoral sponsor(s).

Graduate Student and Postdoctoral Mentorship: List the names and current organizational affiliation of any graduate students and postdoctoral associates that you have helped mentor

during the last 5 years while at your institution in order to support your research activities.

Personally Identifiable Information (PII): Do not include sensitive personally identifiable information such as a Social Security Number, date of birth, city of birth, home address, etc. Pay particular attention to the content of biographical sketches and curriculum vitae. Do not include information that a merit reviewer should not make use of.

APPENDIX 3: CURRENT AND PENDING SUPPORT

Provide a list of all current and pending support (both Federal and non-Federal) for the Project Director/Principal Investigator(s) (PD/PI) and senior/key person(s), including subawardees, for ongoing projects and pending applications.

List all sponsored activities or awards requiring a measurable commitment of effort, whether paid or unpaid.

For every activity, list the following items:

- The sponsor of the activity or the source of funding
- The award or other identifying number
- The title of the award or activity
- The project period of the award or activity
- The total cost or value of the award or activity, including direct and indirect costs. For pending proposals, provide the total amount of requested funding.
- The person-months of effort per year being dedicated to the award or activity
- The “Project Abstract”, which includes brief details on the scope of research. A level of detail sufficient to identify similarities and differences with the work presented in the application being submitted is required. Do not simply list the title of the current and/or pending grant.

The application review process will include an assessment of the applicants’ ability to carry out the proposed research in light of any other commitments. Applicants who have applied to more than one agency with proposals of substantially similar scope will be expected to withdraw all other applications submitted to DOE should one of these proposals be funded by another sponsor.

Provide the Current and Pending Support as an appendix to your project narrative. Concurrent submission of an application to other organizations for simultaneous consideration will not prejudice its review.

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

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 (2016). You may also use this convention in the biographical sketches. Include only bibliographic citations. Applicants should be especially careful to follow scholarly practices in providing citations for source materials relied upon when preparing any section of the application. Provide the Bibliography and References Cited information as an appendix to your project narrative.

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

APPENDIX 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: ADDITIONAL BUDGET REQUIREMENTS

If support is requested from two or more research subprograms, you must provide separate budget and budget justifications for each research subprogram in the proposal for each year in which funding is being requested and for the cumulative funding period. This requirement is in addition to completing Section IV Subsection 3 on “Research and Related Budget” for the total project budget. Clearly label each sheet at the top by research subprogram and year.

This requirement does not apply to proposals that request support from a single research thrust, e.g., Accelerator Science and Technology R&D, Theory, CMS, LUX, DUNE, etc.

Applications must meet the following guidelines when providing the budget information:

- See Subsection 3 on “Research and Related Budget” for further information regarding budget fields and accurate budget information needed within each research subprogram described in the proposal.
- Budgets must be presented in Standard Form (SF) 424 Research and Related (R&R) style. SF-424 (R&R) budgets are available from <https://www.Grants.gov>. The use of other sources for budgets that look like a SF-424 (R&R) budget is permissible.
- Provide the additional budget requirements as an appendix to your project narrative.
- Do not attach a separate file.
- This appendix will not count against the project narrative page limitation.

If any investigator requests support from two or more HEP research subprograms and/or thrusts (including two or more thrusts in the same research subprogram), you should provide information on the distribution of effort for them in a table, an example of which is shown below. Investigators should modify the table for their proposed efforts, as appropriate.

Name and Yearly FTE for Senior Investigators with Multiple HEP Subprograms or Research Thrusts						
Name	Proposal Project Period					
	Budget Period 1		Budget Period 2		Budget Period 3	
	Name of Subprogram 1 or Thrust 1	Name of Subprogram 2 or Thrust 2	Name of Subprogram 1 or Thrust 1	Name of Subprogram 2 or Thrust 2	Name of Subprogram 1 or Thrust 1	Name of Subprogram 2 or Thrust 2
	FTE	FTE	FTE	FTE	FTE	FTE
Senior Investigator A	0	100%	25%	75%	50%	50%
Senior Investigator B	50%	50%	25%	75%	0%	100%

Example Effort Table (for Proposals with Any Investigator on Multiple HEP Subprograms or Thrusts)

APPENDIX 8: DATA MANAGEMENT PLAN

All applications must provide a Data Management Plan (DMP) that addresses the following requirements:

1. DMPs should describe whether and how data generated in the course of the proposed research will be shared and preserved. If the plan is not to share and/or preserve certain data, then the plan must explain the basis of the decision (for e.g., 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 (<http://science.energy.gov/funding-opportunities/digital-data-management/>). This requirement could be met by including the data as supplementary information to the published article, or through other means. The published article should indicate how these data can be accessed.

3. DMPs should consult and reference available information about data management resources to be used in the course of the proposed research. In particular, DMPs that explicitly or implicitly commit data management resources at a facility beyond what is conventionally made available to approved users should be accompanied by written approval from that facility. In determining the resources available for data management at Office of Science User Facilities, researchers should consult the published description of data management resources and practices at that facility and reference it in the DMP. Information about other Office of Science facilities can be found in the additional guidance from the sponsoring program.
4. DMPs must protect confidentiality, personal privacy, Personally Identifiable Information (PII), 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.

For experimental-based applications, applicants proposing to carry out research for a specific experiment within a HEP subprogram may indicate they collaborate on an experiment, and where applicable, provide a reference to the experiment's publically available Data Management Plan (e.g., experiment-specific document identification number and the URL internet address to the document). This information should be supplemented with any application-specific material addressing the above four requirements, as well as indicating how the proposed work and data generated relates to the experiment.

For applications with theory or simulation content, note that any data, including simulations or theoretical work such as points in a plot generated by the proposed research, must be covered by the DMP. A completely data-free research program still requires a DMP stating that no data will be generated with a brief explanation of the reasons based on the scope of research described in the project narrative.

DMPs will be reviewed as part of the overall research proposal merit review process. Applicants are encouraged to consult the Office of Science website for further information, suggestions, and HEP-specific guidance on how to structure a DMP: <http://science.energy.gov/funding-opportunities/digital-data-management/>.

- This appendix should **not exceed 2 pages per HEP research thrust where support is being requested in the application**, including charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard 8.5" by 11" paper with 1-inch margins (top, bottom, left, and right). The font must not be smaller than 11 point.
- Do not attach a separate file.

- This appendix will not count in the project narrative page limitation.

DMPs are required for all applications submitted to this FOA and these should address the above guidelines for each HEP research thrust where support is being requested. **Any particular HEP research thrust in an application, where support is being requested, that does not provide a DMP or does not comply with the above guidelines will be declined without review, and therefore, that research thrust cannot be considered for funding.**

APPENDIX 9: OTHER ATTACHMENT

If you need to elaborate on your responses to questions 1-6 on the “Other Project Information” document, please provide the Other Attachment information as an appendix to your project narrative. Information not easily accessible to a reviewer may be included in this appendix, with the exception of the material described below. Do not use this appendix to circumvent the page limitations of the application. Reviewers are not required to consider information in this appendix, and reviewers may not have time to read extensive appendix materials with the same care they would use with the application proper.

- Do not include copies of previously presented and/or published research papers, technical notes, and/or reports written for respective experiments or collaborations. Further, do not include presentations made at any meetings or conferences
- Do not attach a separate file.
- This appendix will not count in the project narrative page limitation.
- **Do not attach any of the requested appendices described above as files for fields 9, 10, 11, and 12.**
- **Follow the above instructions to include the information as appendices to the project narrative file.**
- **These appendices will not count toward the project narrative’s page limitation.**

3. Research and Related Budget

Complete the Research and Related Budget form in accordance with the instructions on the form (Activate Help Mode to see instructions) and the following instructions. You must complete a separate budget for each year of support requested. The form will generate a cumulative budget for the total project period. You must complete all the mandatory information on the form before the NEXT PERIOD button is activated. You may request funds under any of the categories listed as long as the item and amount are necessary to perform the proposed work, meet all the criteria for allowability under the applicable Federal cost principles, and are not prohibited by the funding restrictions in this FOA (see Section IV. G.).

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
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	<p>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.</p> <p>Include a written narrative in the budget justification that justifies the need for requested personnel.</p>
Section B Other Personnel	<p>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.</p> <p>Include a written narrative in the budget justification that fully justifies the need for requested personnel.</p>
Section C Equipment	<p>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. If institutional policies provide for a lower threshold of capitalization costs, the designation of an item as equipment on the budget must be consistent with those policies. (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. Allowable items ordinarily will be limited to research equipment and apparatus not already available for the conduct of the work. General-purpose office equipment is not eligible for support unless primarily or exclusively used in the actual conduct of scientific research.</p>
Section D Travel	<p>For purposes of this section only, travel to Canada or to Mexico is considered domestic travel. In the budget justification, list each trip's destination, dates, estimated costs including transportation and subsistence, number of staff traveling, the purpose of the travel, and how it relates to the project. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). To qualify for support, attendance at meetings or conferences must enhance the investigator's capability to perform the research, plan extensions of it, or disseminate its results. Domestic travel is to be justified separately from foreign travel.</p>
Section E Participant/Trainee Support Costs	<p>If applicable, submit training support costs. Educational projects that intend to support trainees (precollege, college, graduate and post graduate) must list each trainee cost that includes stipend levels and amounts, cost of tuition for each trainee, cost of any travel (provide the same information as needed under the regular travel category), and costs for any related training expenses. Participant costs are those costs associated with conferences, workshops, symposia or institutes and breakout items should indicate the number of participants, cost for each participant, purpose of the conference, dates and places of meetings and any related administrative expenses.</p> <p>Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis).</p>
Section F	<ul style="list-style-type: none"> • Materials and Supplies (M&S): Enter total funds requested for

Other Direct Costs	<p>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).</p> <ul style="list-style-type: none"> • Publication Costs: Enter the total publication funds requested. The proposal budget may request funds for the costs of documenting, preparing, publishing or otherwise making available to others the findings and products of the work conducted under the award. In the budget justification, include supporting information. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). • Consultant Services: Enter total funds requested for all consultant services. In the budget justification, identify each consultant, the services he/she will perform, total number of days, travel costs, and total estimated costs. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). • ADP/Computer Services: Enter total funds requested for ADP/Computer Services. The cost of computer services, including computer-based retrieval of scientific, technical and education information may be requested. In the budget justification, include the established computer service rates at the proposing organization if applicable. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). • Subawards/Consortium/Contractual Costs: Enter total costs for all subawards/consortium organizations and other contractual costs proposed for the project. In the budget justification, justify the details. See Section C.4. for additional instructions. • 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
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	justification to further itemize and justify.
Section G Direct Costs	This represents Total Direct Costs (Sections A through F)
Section H Other Indirect Costs	Enter the Indirect Cost information for each field. Only four general categories of indirect costs are allowed/requested on this form. If additional room is needed, use the budget justification to provide the required data. Include the cognizant Federal agency and contact information if using a negotiated rate agreement.
Section I Total Direct and Indirect Costs	This is the total of Sections G and H.

BUDGET JUSTIFICATION (FIELD K ON THE FORM)

Provide the required supporting information for the following costs (see R&R Budget instructions): equipment; domestic and foreign travel; participant/trainees; materials and supplies; publication; consultant services; ADP/computer services; subaward/consortium/contractual; equipment or facility rental/user fees; alterations and renovations; and indirect cost type. Provide any other information you wish to submit to justify your budget request. **Attach a single budget justification file for the entire project period in field K.** The file automatically carries over to each budget year.

In addition, include a written narrative in the budget justification that justifies the need for requested personnel. The budget justification must also include, for each person:

- the person’s name if known at the time of application (if unknown, state “TBD”);
- the person’s title on the project if known at the time of application (if unknown, state “TBD”);
- the person’s institutional base salary;
- the person’s effort commitment in person-months;
- the person’s requested salary;
- the person’s requested fringe benefits; and
- the person’s total requested cost.

This data may be efficiently presented in a table.

4. R&R Subaward Budget Attachment(s) Form

Budgets for Subawardees, other than DOE FFRDC Contractors: You must provide a separate R&R budget for each subawardee. Download the R&R Budget Attachment from the R&R SUBAWARD BUDGET ATTACHMENT(S) FORM and e-mail it to each subawardee that is required to submit a separate budget. After the subawardee has e-mailed its completed budget back to you, attach it to one of the blocks provided on the form. Use up to 10 letters of the subawardee’s name (plus.pdf) as the file name (e.g., ucla.pdf or energyres.pdf). Filenames should not exceed 50 characters.

If the project involves more subawardees than there are places in the SUBAWARD BUDGET

ATTACHMENT(S) FORM, the additional subaward budgets may be saved as PDF files and appended to the Budget Justification attached to Field K.

Ensure that any files received from subawardees are the PDF files extracted from the SUBAWARD BUDGET ATTACHMENT(S) FORM. Errors will be created if a subawardee sends a prime applicant a budget form that was not extracted from the application package.

5. Project/Performance Site Location(s)

Indicate the primary site where the work will be performed. If a portion of the project will be performed at any other site(s), identify the site location(s) in the blocks provided.

Note that the Project/Performance Site Congressional District is entered in the format of the 2-digit state code followed by a dash and a 3-digit Congressional district code, for example VA-001. Hover over this field for additional instructions.

Use the Next Site button to expand the form to add additional Project/Performance Site Locations.

6. SF-LLL Disclosure of Lobbying Activities

If applicable, complete SF-LLL. Applicability: If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the grant/cooperative agreement, you must complete and submit Standard Form – LLL, "Disclosure Form to Report Lobbying."

7. Summary of Required Forms/Files

Your application must include the following items:

Name of Document	Format	Attach to
SF-424 (R&R)	Form	N/A
RESEARCH AND RELATED Other Project Information	Form	N/A
Project Summary/Abstract	PDF	Field 7
Project Narrative, including required appendices	PDF	Field 8
RESEARCH & RELATED BUDGET	Form	N/A
Budget Justification	PDF	Field K
R&R SUBAWARD BUDGET ATTACHMENT(S) FORM (if applicable)	Form	N/A
Subawardee Budget Justification (if applicable)	PDF	Field K

PROJECT/PERFORMANCE SITE LOCATION(S)	Form	N/A
SF-LLL Disclosure of Lobbying Activities, if applicable	Form	N/A

D. SUBMISSIONS FROM SUCCESSFUL APPLICANTS

If selected for award, DOE reserves the right to request additional or clarifying information for any reason deemed necessary, including, but not limited to:

- Indirect cost information
- Other budget information
- Name and phone number of the Designated Responsible Employee for complying with national policies prohibiting discrimination (see 10 CFR 1040.5)
- Representation of Limited Rights Data and Restricted Software, if applicable
- Commitment Letter from Third Parties Contributing to Cost Sharing, if applicable

E. SUBMISSION DATES AND TIMES

1. Letter of Intent Due Date

August 10, 2017, at 5 PM Eastern Time

You are encouraged to submit your Letter of Intent well before the deadline.

2. Pre-application Due Date

Pre-applications are not required

3. Application Due Date

September 12, 2017, at 5 PM Eastern Time

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

4. Late Submissions

Applications received after the deadline will not be reviewed or considered for award, with a possible exception(s) noted below.

Delays in submitting letters of intent, pre-applications, and applications 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.

If you chose to wait until the day of the deadline to begin your submission, your request for a late submission will not be viewed favorably.

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

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

You may be able to submit your application in response to the currently available Office of Science Annual Solicitation. Please contact the Program Office/Manager listed in this Funding Opportunity Announcement to discuss this option.

F. INTERGOVERNMENTAL REVIEW

This program is not subject to Executive Order 12372 – Intergovernmental Review of Federal Programs.

G. FUNDING RESTRICTIONS

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

Cost Principles: Costs must be allowable, allocable and reasonable in accordance with the applicable Federal cost principles referenced in 2 CFR 200 as modified by 2 CFR 910 (DOE Financial Assistance Regulation).

Pre-award Costs: Recipients may charge to an award resulting from this FOA pre-award costs that were incurred within the ninety (90) calendar day period immediately preceding the effective date of the award, if the costs are allowable in accordance with the applicable Federal cost principles referenced in 2 CFR 200 as modified by 2 CFR 910 (DOE Financial Assistance Regulation). Recipients must obtain the prior approval of the contracting officer for any pre-award costs that are for periods greater than this 90 day calendar period.

Pre-award costs are incurred at the applicant's risk. DOE is under no obligation to reimburse

such costs if for any reason the applicant does not receive an award or if the award is made for a lesser amount than the applicant expected.

H. OTHER SUBMISSION AND REGISTRATION REQUIREMENTS

1. Systems to Register In

There are several one-time actions you must complete in order to submit an application in response to this FOA. Applicants not currently registered with SAM and Grants.gov should allow **at least 44 days** to complete these requirements. You should start the process as soon as possible.

Applicants must obtain a DUNS number at <http://fedgov.dnb.com/webform>.

Applicants must register with the System for Award Management (SAM) at <http://www.sam.gov/>. If you had an active registration in the Central Contractor Registry (CCR), you should have an active registration in SAM. More information about SAM registration for applicants is found at https://www.sam.gov/sam/transcript/Quick_Guide_for_Grants_Registrations_v1.7.pdf.

Applicants must provide a Taxpayer Identification Number (TIN) to complete their registration in SAM.gov. An applicant's TIN is an Employer Identification Number (EIN) assigned by the Internal Revenue Service (IRS). In limited circumstances, a Social Security Number (SSN) assigned by the Social Security Administration (SSA) may be used as a TIN. You may obtain an EIN from the IRS at [http://www.irs.gov/Businesses/Small-Businesses-%26-Self-Employed/Apply-for-an-Employer-Identification-Number-\(EIN\)-Online](http://www.irs.gov/Businesses/Small-Businesses-%26-Self-Employed/Apply-for-an-Employer-Identification-Number-(EIN)-Online).

DOE discourages the use of a SSN as a TIN. You are encouraged to obtain a TIN from the Internal Revenue Service (IRS) using the website listed above.

Applicants must register with FedConnect at www.fedconnect.net. The full, binding version of assistance agreements will be posted to FedConnect.

Recipients must register with the Federal Funding Accountability and Transparency Act Subaward Reporting System at <https://www.fars.gov>. This registration must be completed before an award may be made: you are advised to register while preparing your application.

2. Registering in Grants.gov

Applicants must register with Grants.gov.

For organizations, please follow the procedures detailed below, making use of the checklist provided below:

<https://www.grants.gov/web/grants/applicants/organization-registration.html>

For individuals, please follow the procedures detailed below:

<https://www.grants.gov/web/grants/applicants/individual-registration.html>

Organizations and individuals must have an E-Business (E-Biz) Point of Contact (POC). You may find the checklist at <https://www.grants.gov/web/grants/applicants/organization-registration/step-4-aor-authorization.html> useful.

Grants.gov maintains a User Guide at https://www.grants.gov/help/html/help/table_of_contents.htm and a list of Frequently Asked Questions at <https://www.grants.gov/web/grants/applicants/applicant-faqs.html>. Questions relating to the registration process, **system requirements, or how an application form works** must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov.

FIRST-TIME REGISTRATION PROCESS IN GRANTS.GOV

You must complete the one-time registration process (all steps) before you can submit your first application through www.grants.gov. (See <http://www.grants.gov/web/grants/applicants/grant-application-process.html>). We recommend that you start this process at least six weeks before the application due date. It may take 44 days or more to complete the entire process. Use the Grants.gov Organizational Registration Checklists at <https://www.grants.gov/web/grants/applicants/organization-registration.html> to guide you through the process. **IMPORTANT:** During the SAM registration process, you will be asked to designate an E-Business Point of Contact (EBIZ POC). The EBIZ POC must obtain a special password called "Marketing Partner Identification Number" (MPIN). When you have completed the process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e., Grants.gov registration).

After an application is submitted, the Authorized Organization Representative (AOR) will receive a series of four e-mails. It is extremely important that the AOR watch for and save each of the emails. It may take up to two (2) business days from application submission to receipt of email Number 2. The titles of the four e-mails are:

- Number 1 - Grants.gov Submission Receipt Number
- Number 2 - Grants.gov Submission Validation Receipt for Application Number
- Number 3 - Grants.gov Grantor Agency Retrieval Receipt for Application Number
- Number 4 - Grants.gov Agency Tracking Number Assignment for Application Number

IMPORTANT NOTICE: When you have completed the Grants.gov registration process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e., grants.gov registration).

3. Where to Submit an Application

Applications must be submitted through grants.gov to be considered for award.

Applicants must download the application package, application forms and instructions, from grants.gov at <https://www.grants.gov/>

(Additional instructions are provided in Section IV A of this FOA.)

Submit electronic applications through the “Apply for Grants” function at www.grants.gov. If you have problems completing the registration process or submitting your application, call grants.gov at 1-800-518-4726 or send an email to support@grants.gov.

Please ensure that you have read the applicable instructions, guides, help notices, frequently asked questions, and other forms of technical support on Grants.gov.

4. DOE Office of Science Portfolio Analysis and Management System (PAMS)

After you submit your application through Grants.gov, the application will automatically transfer into the Portfolio Analysis and Management System (PAMS) for processing by the DOE Office of Science. Many functions for grants and cooperative agreements can be done in PAMS, which is available at <https://pamspublic.science.energy.gov>.

You will want to “register to” your application: a process of linking yourself to the application after it has been submitted through Grants.gov and processed by DOE.

You must register in PAMS to submit a pre-application or a letter of intent.

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

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

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

1. CREATE PAMS ACCOUNT:

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

- Click the “No, I have never had an account” link and then the “Create Account” button.
- You will be prompted to enter your name and email address, create a username and password, and select a security question and answer. Once you have done this, click the “Save and Continue” button.
- On the next page, enter the required information (at least one phone number and your mailing address) and any optional information you wish to provide (e.g., FAX number, website, mailstop code, additional email addresses or phone numbers, Division/Department). Click the “Create Account” button.
- Read the user agreement and click the “Accept” button to indicate that you understand your responsibilities and agree to comply with the rules of behavior for PAMS.

- PAMS will take you to the “Having Trouble Logging In?” page. (If you have been an Office of Science merit reviewer or if you have previously submitted an application, you may already be linked to an institution in PAMS. If this happens, you will be taken to the PAMS home page.)

2. REGISTER TO YOUR INSTITUTION:

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

For help with PAMS, click the “External User Guide” link on the PAMS website, <https://pamspublic.science.energy.gov/>. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, email: sc.pams-helpdesk@science.doe.gov. All submission and inquiries about this Funding Opportunity Announcement should reference **DE-FOA-0001781**.

5. Viewing Submitted Applications

Each grants.gov application submitted to the DOE Office of Science (SC) automatically transfers into PAMS and is subsequently assigned to a program manager. At the time of program manager assignment, the three people listed on the SF-424 (R&R) cover page will receive an email with the subject line, “Receipt of Proposal 00001781xx by the DOE Office of Science.” These three people are the Principal Investigator (Block 14), Authorized Representative (Block 19), and Point of Contact (Block 5). In PAMS notation, applications are known as proposals, the Principal

Investigator is known as the PI, the Authorized Representative is known as the Sponsored Research Officer/Business Officer/Administrative Officer (SRO/BO/AO), and the Point of Contact is known as the POC.

There will be a period of time between the application's receipt at Grants.gov and its assignment to a DOE Office of Science program manager. Program managers are typically assigned two weeks after applications are due at Grants.gov: please refrain from attempting to view the proposal in PAMS until you receive an email providing the assignment of a program manager.

Once the email is sent, the PI, SRO/BO/PO, and POC will each be able to view the submitted proposal in PAMS. Viewing the proposal is optional.

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

Following are two sets of instructions for viewing the submitted proposal, one for individuals who already have PAMS accounts and one for those who do not.

If you already have a PAMS account, follow these instructions:

1. Log in to PAMS at <https://pamspublic.science.energy.gov/>.
2. Click the "Proposals" tab and click "Access Previously Submitted Grants.gov Proposal."
3. Enter the following information:
 - Proposal ID: Enter the ten-digit PAMS proposal ID, including the leading zeros (e.g., 00002xxxxx). Do not use the Grants.gov proposal number. Use the PAMS number previously sent to you in the email with subject line, "Receipt of Proposal ...".
 - Email (as entered in Grants.gov application): Enter your email address as it appears on the SF424(R&R) Cover Page.
 - Choose Role: Select the radio button in front of the role corresponding to the SF-424 (R&R) cover page. If your name appears in block 19 of the SF-424 (R&R) cover page as the authorizing representative, select "SRO/BO/AO (Sponsored Research Officer/Business Officer/Administrative Officer)." If your name appears in block 14 of the SF424 R&R cover page as the PI, select "Principal Investigator (PI)." If your name appears in block 5 of the SF424 R&R as the point of contact, select "Other (POC)."
4. Click the "Save and Continue" button. You will be taken to your "My Proposals" page. The grants.gov proposal will now appear in your list of proposals. Click the "Actions/Views" link in the options column next to this proposal to obtain a dropdown list. Select "Proposal" from the dropdown to see the proposal. Note that the steps above will work only for proposals submitted to the DOE Office of Science since May 2012.

If you do not already have a PAMS account, follow these instructions:

1. To register, click the "Create New PAMS Account" link on the website <https://pamspublic.science.energy.gov/>.
2. Click the "No, I have never had an account" link and then the "Create Account" button.
3. 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.

4. 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.
5. 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.
6. You will be taken to the Register to Institution page. Select the link labeled, “Option 1: My institution has submitted a proposal in Grants.gov. I am here to register as an SRO, PI, or POC (Sponsored Research Officer, Principal Investigator, or Point of Contact).”
7. Enter the following information:
 - Proposal ID: Enter the ten-digit PAMS proposal ID, including the leading zeros (e.g., 00002xxxxx). Do not use the Grants.gov proposal number. Use the PAMS number previously sent to you in the email with subject line, “Receipt of Proposal ...”.
 - Email (as entered in Grants.gov proposal): Enter your email address as it appears on the SF424(R&R) Cover Page.
 - Choose Role: Select the radio button in front of the role corresponding to the SF-424 (R&R) cover page. If your name appears in block 19 of the SF-424 (R&R) cover page as the authorizing representative, select “SRO/BO/AO (Sponsored Research Officer/Business Officer/Administrative Officer).” If your name appears in block 14 of the SF424 R&R cover page as the PI, select “Principal Investigator (PI).” If your name appears in block 5 of the SF424 R&R as the point of contact, select “Other (POC).”
8. Click the “Save and Continue” button. You will be taken to your “My Proposals” page. The grants.gov proposal will now appear in your list of proposals. Click the “Actions/Views” link in the options column next to this proposal to obtain a dropdown list. Select “Proposal” from the dropdown to see the proposal.

If you were listed as the PI on a prior submission but you have not previously created an account, you may already be listed in PAMS. If this is the case, you will be taken to the PAMS home page after agreeing to the Rules of Behavior. If that happens, follow the instructions listed above under “If you already have a PAMS account...” to access your grants.gov proposal.

The steps above will work only for proposals submitted to the DOE Office of Science since May 2012.

For help with PAMS, click the “External User Guide” link on the PAMS website, <https://pamspublic.science.energy.gov/>. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9 AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, Email: sc.pams-helpdesk@science.doe.gov. All submission and inquiries about this Funding Opportunity Announcement should reference **DE-FOA-0001781**.

Section V - APPLICATION REVIEW INFORMATION

A. CRITERIA

1. Initial Review Criteria

Prior to a comprehensive merit evaluation, DOE will perform an initial review in accordance with 10 CFR 605.10(b) to determine that (1) the applicant is eligible for the award; (2) the information required by the FOA has been submitted; (3) all mandatory requirements are satisfied; (4) the proposed project is responsive to the objectives of the funding opportunity announcement, and (5) the proposed project is not duplicative of programmatic work. Applications that fail to pass the initial review will not be forwarded for merit review and will be eliminated from further consideration.

2. Merit Review

Applications will be subjected to scientific merit review (peer review) and will be evaluated against the following criteria found in 10 CFR 605.10 (d), the Office of Science Financial Assistance Program Rule. These criteria, and the one that follows them, are listed in descending order of importance.

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

Merit reviewers will be asked to evaluate one additional criterion:

- Relevance of the proposed research to the HEP program priorities;

The questions below are provided to the merit reviewers to consider when evaluating the criteria:

SCIENTIFIC AND/OR TECHNICAL MERIT OF THE PROPOSED RESEARCH

- What is the scientific scope and impact of the proposed effort?
- How might the results of the proposed work impact the direction, progress, and thinking in relevant scientific fields of research?
- What is the likelihood of achieving valuable results?
- How does the merit of the proposed research, both in terms of scientific and/or technical merit and originality, compare with other efforts within the same research area for a) applications submitted to this FOA and b) those in the overall HEP field?
- Is the Data Management Plan suitable for the proposed research and to what extent does it support the validation of research results?

APPROPRIATENESS OF THE PROPOSED METHOD OR APPROACH

- Does the proposed effort employ innovative concepts or methods?
- How logical and feasible are the approaches?

- Are the conceptual framework, methods, and analyses well justified, adequately developed, and likely to lead to scientifically valid conclusions?
- Does the applicant recognize significant potential problems and consider alternative strategies?

COMPETENCY OF APPLICANT'S PERSONNEL AND ADEQUACY OF PROPOSED RESOURCES

- How well qualified is each senior investigator and their team, and what is the likelihood of success in carrying out the proposed work?
- Does the proposed work take advantage of unique facilities and capabilities?
- What is the past scientific performance of the team, including the dissemination of results?
- Are any proposed plans for recruiting any additional scientific and/or technical personnel including new senior staff, students and postdocs reasonable, justified, and appropriate?
- Are the environment and facilities adequate for performing the proposed effort, including any synergistic opportunities, institutional support, and/or infrastructure?
- Are the senior investigator(s) or any members of the research group that are being reviewed leaders within the proposed effort(s) and/or potential future leaders in the field?
- For senior investigator(s) proposing to work across multiple research thrusts, are the plans for such cross-cutting efforts reasonably developed and will the proposed activities have impact?

REASONABLENESS AND APPROPRIATENESS OF THE PROPOSED BUDGET

- Are the proposed budget and staffing levels adequate to carry out the proposed work?
- If multiple research thrusts are proposed, is the balance of proposed efforts reasonable and well-matched to the proposed research goals?
- Are all travel, student costs, and other ancillary expenses adequately estimated and justified?
- Is the budget reasonable and appropriate for the scope?

RELEVANCE OF THE PROPOSED RESEARCH TO THE HEP PROGRAM PRIORITIES

- How does the proposed research of each senior investigator contribute to the mission, science goals, and programmatic priorities of the subprogram in which the application is being evaluated?
- Is the proposed research consistent with HEP's overall priorities and strategic plan?
- For multi-thrust proposals, does the scope of the full proposed program provide synergy or additional benefits to the HEP mission beyond the individual thrusts?
- How likely is the research to impact the direction of the overall HEP program?
- For senior investigator(s) proposing to work and/or transition across multiple research thrusts during the project period, will their overall efforts add value in the broader context of HEP program goals?

Note that external peer reviewers are selected with regard to both their scientific expertise and the absence of conflict-of-interest issues. Both Federal and non-Federal reviewers may be used, and submission of an application constitutes agreement that this is acceptable to the investigator(s) and the submitting institution.

B. REVIEW AND SELECTION PROCESS

1. Merit Review

Applications that pass the initial review will be subjected to a formal merit review and will be evaluated based on the criteria stated above in Section V.A.2.

2. Program Policy Factors

The Selection Official may consider any of the following program policy factors, in making the selection:

- The application's alignment and relevance to compelling scientific opportunities identified in the 2014 Particle Physics Project Prioritization Panel (P5) strategic plan, available at: https://science.energy.gov/~media/hep/hepap/pdf/May-2014/FINAL_P5_Report_Interactive_060214.pdf;
- The application's role in ensuring an appropriate balance of activities within the HEP research program areas;
- Fostering the development of a diverse cadre of supported Principal Investigators;
- The institutional, jurisdictional and other commitments described in the application; and
- The opportunity for training junior scientific personnel consistent with the proposed research scope.

3. Selection

Selection of applications for award will be based upon the following criteria:

- The results of merit review as described in Section V.A.2;
- The availability of funding;
- The applicant's performance under existing awards, if applicable (of relevance to renewal applications and new applications that constitute an outgrowth or next step of currently-supported work);
- Other available advice and information in the scientific community such as those available through HEP program advisory panels or input from the management of multi-institutional cooperative endeavors; and
- The Program Policy Factors as described above.

3. Review of Risk

Pursuant to 2 CFR 200.205, DOE may conduct an additional review of the risk posed by applications submitted under this FOA. Such review of risk may include:

- Technical merit of the application;
- Reports and findings from audits performed under 2 CFR 200 or OMB Circular A-133; and
- Systems maintained under 2 CFR 180.

DOE may make use of other publicly available information and the history of an applicant's performance under DOE or other Federal agency awards.

Applicants with no prior performance of DOE awards may be asked to provide information

about their financial stability and or their ability to comply with the management standards of 2 CFR 200.

REPORTING OF MATTERS RELATED TO RECIPIENT INTEGRITY AND PERFORMANCE (DECEMBER 2015)

DOE, prior to making a Federal award with a total amount of Federal share greater than the simplified acquisition threshold, is required to review and consider any information about the applicant that is in the designated integrity and performance system accessible through SAM (currently FAPIIS) (see 41 U.S.C. 2313); The applicant, at its option, may review information in the designated integrity and performance systems accessible through SAM and comment on any information about itself that a Federal awarding agency previously entered and is currently in the designated integrity and performance system accessible through SAM; DOE will consider any written comments by the applicant, in addition to the other information in the designated integrity and performance system, in making a judgment about the applicant's integrity, business ethics, and record of performance under Federal awards when completing the review of risk posed by applicants as described in §200.205 Federal awarding agency review of risk posed by applicants.

4. Discussions and Award

The Government may enter into discussions with a selected applicant for any reason deemed necessary, including but not limited to the following: (1) the budget is not appropriate or reasonable for the requirement; (2) only a portion of the application is selected for award; (3) the Government needs additional information to determine that the recipient is capable of complying with the requirements in 2 CFR 200 as modified by 2 CFR 910 (DOE Financial Assistance Regulation); and/or (4) special terms and conditions are required. Failure to resolve satisfactorily the issues identified by the Government will preclude award to the applicant.

C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES

DOE is striving to make awards within six months of the receipt of applications. It is anticipated that selections will be completed in the winter of 2017-18 and that awards will be made during the spring of 2018.

Section VI - AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES

1. Notice of Selection

Selected Applicants Notification: DOE will notify applicants selected for award. This notice of selection is not an authorization to begin performance. (See Section IV.G. with respect to the allowability of pre-award costs.)

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

2. Notice of Award

An Assistance Agreement issued by the contracting officer is the authorizing award document. It normally includes, either as an attachment or by reference, the following items: (1) Special Terms and Conditions; (2) Applicable program regulations, if any; (3) Application as approved by DOE; (4) 2 CFR 200 as modified by 2 CFR 910 (DOE Financial Assistance Regulation); (5) National Policy Assurances To Be Incorporated As Award Terms; (6) Budget Pages; (7) Federal Assistance Reporting Checklist, which identifies the reporting requirements; and (8) Intellectual Property Provisions

For grants and cooperative agreements made to universities, non-profits and other entities subject to Title 2 CFR, research awards made under this funding opportunity will be subject to the government-wide Research Terms and Conditions published at https://www.nsf.gov/pubs/policydocs/rtrtcoverlay_march17.pdf and the DOE Agency Specific Standard Research Terms and Conditions published at https://www.nsf.gov/pubs/policydocs/rtrtcoverlay_march17.pdf. These Terms and Conditions will be incorporated in the award by reference.

B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

1. Administrative Requirements

The administrative requirements for DOE grants and cooperative agreements are contained in 2 CFR 200 as modified by 2 CFR 910 (DOE Financial Assistance Regulation).

For grants and cooperative agreements made to universities, non-profits and other entities subject to Title 2 CFR, research awards made under this funding opportunity will be subject to the government-wide Research Terms and Conditions published at https://www.nsf.gov/pubs/policydocs/rtrtcoverlay_march17.pdf and the DOE Agency Specific Standard Research Terms and Conditions published at https://www.nsf.gov/pubs/policydocs/rtrtcoverlay_march17.pdf. These Terms and Conditions will be incorporated in the award by reference.

NONDISCLOSURE AND CONFIDENTIALITY AGREEMENTS REPRESENTATIONS (JUNE 2015)

In submitting an application in response to this FOA the Applicant represents that:

(1) It **does not and will not** require its employees or contractors to sign internal nondisclosure or confidentiality agreements or statements prohibiting or otherwise restricting its employees or contractors from lawfully reporting waste, fraud, or abuse to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information.

(2) It **does not and will not** use any Federal funds to implement or enforce any nondisclosure and/or confidentiality policy, form, or agreement it uses unless it contains the following provisions:

a. *“These provisions are consistent with and do not supersede, conflict with, or otherwise alter the employee obligations, rights, or liabilities created by existing statute or Executive order relating to (1) classified information, (2) communications to Congress, (3) the reporting to an Inspector General of a violation of any law, rule, or regulation, or mismanagement, a gross waste of funds, an abuse of authority, or a substantial and specific danger to public health or safety, or (4) any other whistleblower protection. The definitions, requirements, obligations, rights, sanctions, and liabilities created by controlling Executive orders and statutory provisions are incorporated into this agreement and are controlling.”*

b. The limitation above shall not contravene requirements applicable to Standard Form 312, Form 4414, or any other form issued by a Federal department or agency governing the nondisclosure of classified information.

c. Notwithstanding provision listed in paragraph (a), a nondisclosure or confidentiality policy form or agreement that is to be executed by a person connected with the conduct of an intelligence or intelligence-related activity, other than an employee or officer of the United States Government, may contain provisions appropriate to the particular activity for which such document is to be used. Such form or agreement shall, at a minimum, require that the person will not disclose any classified information received in the course of such activity unless specifically authorized to do so by the United States Government. Such nondisclosure or confidentiality forms shall also make it clear that they do not bar disclosures to Congress, or to an authorized official of an executive agency or the Department of Justice, that are essential to reporting a substantial violation of law.

REGISTRATION REQUIREMENTS

Additional administrative requirements for DOE grants and cooperative agreements are contained in 2 CFR 25 (See: <http://www.ecfr.gov>). Prime awardees must keep their data at the System for Award Management (SAM) current at <http://www.sam.gov>. SAM is the government-wide system that replaced the Central Contractor Registry (CCR). If you had an active registration in the CCR, you have an active registration in SAM. Subawardees at all tiers must

obtain DUNS numbers and provide the DUNS to the prime awardee before the subaward can be issued.

SUBAWARD AND EXECUTIVE REPORTING

Additional administrative requirements necessary for DOE grants and cooperative agreements to comply with the Federal Funding and Transparency Act of 2006 (FFATA) are contained in 2 CFR 170. (See: <http://www.ecfr.gov>). Prime awardees must register with the new FSRS database and report the required data on their first tier subawardees. Prime awardees must report the executive compensation for their own executives as part of their registration profile in the System for Award Management (SAM).

PROHIBITION ON LOBBYING ACTIVITY

By accepting funds under this award, you agree that none of the funds obligated on the award shall be expended, directly or indirectly, to influence congressional action on any legislation or appropriation matters pending before Congress, other than to communicate to Members of Congress as described in 18 USC 1913. This restriction is in addition to those prescribed elsewhere in statute and regulation.

2. Terms and Conditions

The DOE Special Terms and Conditions for Use in Most Grants and Cooperative Agreements are located at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms> under Award Terms.

The standard DOE financial assistance intellectual property provisions applicable to various types of recipients are located at: <http://energy.gov/gc/standard-intellectual-property-ip-provisions-financial-assistance-awards>

3. National Policy Assurances

The National Policy Assurances To Be Incorporated As Award Terms are located at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms> under Award Terms.

4. Additional Conditions

CONFERENCE SPENDING (FEBRUARY 2015)

The recipient shall not expend any funds on a conference not directly and programmatically related to the purpose for which the grant or cooperative agreement was awarded that would defray the cost to the United States Government of a conference held by any Executive branch department, agency, board, commission, or office for which the cost to the United States Government would otherwise exceed \$20,000, thereby circumventing the required notification by the head of any such Executive Branch department, agency, board, commission, or office to

the Inspector General (or senior ethics official for any entity without an Inspector General), of the date, location, and number of employees attending such conference.

CORPORATE FELONY CONVICTION AND FEDERAL TAX LIABILITY REPRESENTATIONS (MARCH 2014)

In submitting an application in response to this FOA the Applicant represents that:

- It is **not** a corporation that has been convicted of a felony criminal violation under any Federal law within the preceding 24 months,
- It is **not** a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

For purposes of these representations the following definitions apply:

- A Corporation includes any entity that has filed articles of incorporation in any of the 50 states, the District of Columbia, or the various territories of the United States [but not foreign corporations]. It includes both for-profit and non-profit organizations.

PUBLICATIONS

The recipient is expected to publish or otherwise make publicly available the results of the work conducted under any award resulting from this Funding Opportunity Announcement. Publications and other methods of public communication describing any work based on or developed under an award resulting from this Funding Opportunity Announcement must contain an acknowledgment of DOE Office of Science support. The format for such acknowledgments is provided at <http://science.energy.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 and made publicly available in accordance with the instructions contained in the Reporting Requirements Checklist incorporated in all Assistance Agreements.

C. REPORTING

Reporting requirements are identified on the Federal Assistance Reporting Checklist and Instructions, DOE F 4600.2, attached to the award agreement. The checklist is available at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms> under Award Forms.

Section VII - QUESTIONS/AGENCY CONTACTS

A. QUESTIONS

Questions relating to the Grants.gov registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov. DOE cannot answer these questions.

- Please only contact the Grants.gov help desk for questions related to Grants.gov.

For help with PAMS, click the “External User Guide” link on the PAMS website, <https://pamspublic.science.energy.gov/>. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll-free) or (301) 903-9610, email: sc.pams-helpdesk@science.doe.gov. All submission and inquiries about this FOA should reference **DE-FOA-0001781**.

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

Questions regarding the specific program areas and technical requirements may be directed to the technical contacts listed for each subprogram within the FOA or the “Program Review Contact” email address below.

- Please contact the relevant program staff with questions not directly related to the Grants.gov or PAMS systems.

Questions regarding the program review process for this FOA may be directed to Dr. Abid Patwa, 301-903-0408, abid.patwa@science.doe.gov

General questions about non-technical matters may be directed to the common email account monitored by administrative personnel.

- Please contact sc.hepfoa@science.doe.gov with any administrative or non-technical questions.

B. AGENCY CONTACTS

Type of Contact	Contact Information
Grants.gov Customer Support	800-518-4726 (toll-free) support@grants.gov
PAMS Customer Support	855-818-1846 (toll-free) 301-903-9610 sc.pams-helpdesk@science.doe.gov
Administrative Contact	For questions about non-technical matters, including program rules, please contact sc.hepfoa@science.doe.gov
Program Review Contact	For questions about the program review process for this FOA, please contact abid.patwa@science.doe.gov
Program Manager Scientific/Technical Contact	For questions about specific program areas and/or technical requirements, please contact the DOE personnel listed in Section I of this FOA.

Section VIII - OTHER INFORMATION

A. MODIFICATIONS

Notices of any modifications to this FOA will be posted on Grants.gov and the FedConnect portal. You can receive an email when a modification or an FOA message is posted by registering with FedConnect as an interested party for this FOA. It is recommended that you register as soon after release of the FOA as possible to ensure you receive timely notice of any modifications or other FOAs. More information is available at <http://www.fedconnect.net>.

B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE

DOE reserves the right, without qualification, to reject any or all applications received in response to this FOA and to select any application, in whole or in part, as a basis for negotiation and/or award.

C. COMMITMENT OF PUBLIC FUNDS

(a) A DOE financial assistance award is valid only if it is in writing and is signed, either in writing or electronically, by a DOE Contracting Officer.

(b) Recipients are free to accept or reject the award. A request to draw down DOE funds constitutes the Recipient's acceptance of the terms and conditions of this Award.

D. PROPRIETARY APPLICATION INFORMATION

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

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

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

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

E. EVALUATION AND ADMINISTRATION BY NON-FEDERAL PERSONNEL

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

F. INTELLECTUAL PROPERTY DEVELOPED UNDER THIS PROGRAM

Patent Rights: The Government will have certain statutory rights in an invention that is conceived or first actually reduced to practice under a DOE award. 42 USC 5908 provides that title to such inventions vests in the United States, except where 35 USC 202 provides otherwise for nonprofit organizations or small business firms. However, the Secretary of Energy may waive all or any part of the rights of the United States subject to certain conditions. (See “Notice of Right to Request Patent Waiver” in paragraph G below.)

Rights in Technical Data: Normally, the Government has unlimited rights in technical data created under a DOE agreement. Delivery or third party licensing of proprietary software or data developed solely at private expense will not normally be required except as specifically negotiated in a particular agreement to satisfy DOE’s own needs or to insure the commercialization of technology developed under a DOE agreement.

G. NOTICE OF RIGHT TO REQUEST PATENT WAIVER

Applicants may request a waiver of all or any part of the rights of the United States in inventions conceived or first actually reduced to practice in performance of an agreement as a result of this FOA, in advance of or within 30 days after the effective date of the award. Even if such advance waiver is not requested or the request is denied, the recipient will have a continuing right under the award to request a waiver of the rights of the United States in identified inventions – i.e., individual inventions conceived or first actually reduced to practice in performance of the award. Any patent waiver that may be granted is subject to certain terms and conditions in 10 CFR 784. For more information, see <http://energy.gov/gc/services/technology-transfer-and-procurement/office-assistant-general-counsel-technology-transf-1>

Domestic small businesses and domestic nonprofit organizations will receive the patent rights clause at 37 CFR 401.14, i.e., the implementation of the Bayh-Dole Act. This clause permits domestic small business and domestic nonprofit organizations to retain title to subject inventions. Therefore, small businesses and nonprofit organizations do not need to request a waiver.

H. NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES

Eligible activities under this program include those which describe and promote the understanding of scientific and technical aspects of specific energy technologies, but not those which encourage or support political activities such as the collection and dissemination of information related to potential, planned or pending legislation.

I. 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.

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

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.

J. ENVIRONMENTAL, SAFETY AND HEALTH (ES&H) PERFORMANCE OF WORK AT DOE FACILITIES

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

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.

K. NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) COMPLIANCE

If question 4.a. on the "Research and Related Other Project Information" document indicates "potential impact on the environment", or if DOE's own review indicates it, DOE may ask the applicant to provide additional information on those impacts in order to prepare an environmental critique/synopsis per 10 CFR 1021.216. Note that this pre-award environmental critique/synopsis process would be separate from the preparation of a NEPA document such as an environmental impact statement (EIS) or an environmental assessment (EA). If DOE determines the latter documentation is necessary, this process would need to be completed, funded by and with the participation of the awardee, prior to them taking any action on the proposed project that could have adverse environmental effects or that could limit the choice of

reasonable alternatives. The inability to satisfy the NEPA requirements after an award would result in cancellation of the award. Note that in most cases, even where potential impact on the environment exists, preparation of such NEPA documents is rarely necessary, but DOE has the expectation that the Applicant will disclose the potential, which would serve to initiate dialog with DOE if necessary.

Section IX - APPENDICES/REFERENCE MATERIAL

Glossary of Useful Grants and Cooperative Agreement terms

acquisition cost	The cost of an asset, including the cost to put it in place. When used with equipment (capital expenditure), the term means the net invoice price of property or supplies including cost of modifications, attachments, accessories, or auxiliary apparatus necessary to make the property usable for the purpose for which it was acquired. Other charges, such as the cost of installation, transportation, taxes, duty, or protective in-transit insurance, are included or excluded from the unit acquisition cost in accordance with the recipient's regular accounting practices. It does not include costs for rental of property or alteration and rental of real property.
administrative requirements	The general business management practices that are common to the administration of all grants, such as financial accountability, reporting, equipment management, and retention of records.
allocation	The process of assigning costs to one or more cost objectives, in reasonable and realistic proportion to the benefit provided or other equitable relationship.
allocability	The principle which requires that an expense or service charged must directly benefit and be necessary for the performance of the project; when multiple projects are benefited reasonable proportions must be able to be assigned.
allowable cost	A cost incurred by a recipient that is: (1) reasonable for the performance of the award; (2) allocable; (3) in conformance with any limitations or exclusions set forth in the Federal cost principles applicable to the organization incurring the cost or in the award documents as to the type or amount of cost; (4) consistent with regulations, policies, and procedures of the recipient that are applied uniformly to both federally supported and other activities of the organization; (5) accorded consistent treatment as a direct or indirect cost; (6) determined in accordance with generally accepted accounting principles; and (7) not included as a cost in any other federally supported award (unless specifically authorized by statute).
application	A request for financial support of a project or activity submitted to DOE on specified forms and in accordance with DOE instructions. Also known as a proposal
Appropriation Act	The statute that provides the authority for Federal agencies to incur obligations to and make payments out of the U.S. treasury for specified purposes.
approved budget	The financial expenditure plan for the grant-supported project or activity, including revisions approved by DOE and permissible revisions made by the grantee. The approved budget consists of Federal (grant) funds and, if required by the terms and conditions of the award, non-Federal participation in the form of matching or cost sharing. The approved budget specified in the award documents may be shown in detailed budget categories or as total costs without a categorical breakout. Expenditures charged to an approved budget that consists of both Federal and non-Federal shares are deemed to be borne by the grantee in the same proportion as the percentage of Federal/non-Federal participation in the overall budget.
assurance	A certification by an applicant, normally included with the application or State plan, indicating that the entity is in compliance with, or that it will abide by, a particular requirement if awarded a Federal grant.
authorized organizational representative award	The individual, named by the applicant organization, who is authorized to act for the applicant and to assume the obligations imposed by the Federal laws, regulations, requirements, and conditions that apply to grant applications or grant awards. The provision of funds by DOE, based on an approved application and budget or progress report, to an organizational entity or an individual to carry out a project or activity.
award documents	The entirety of the documents describing the legal relationship between DOE and an awardee or recipient. The award documents include an Assistance Agreement and other documents which may be incorporated by reference or as attachments to the

Assistance Agreement. The award documents are the official, legally binding document, signed (or the electronic equivalent of signature) by a contracting officer that:

- notifies the recipient of the award of a grant;
- contains or references all the terms and conditions of the grant and Federal funding limits and obligations; and,
- provides the documentary basis for recording the obligation of Federal funds in the DOE accounting system.

Bayh-Dole Act	Law which encourages universities and researchers to develop their inventions into marketable products; formal citation is Section 6 of the Patent and Trademark Amendment of 1980, Pub. L 96-517
budget	An estimate of expenditures to be incurred in the performance of a proposed statement of work, or the financial plan or cost assessment for the grant proposal. The budget represents costs associated with project implementation.
budget period	The intervals of time (usually 12 months each) into which a project period is divided for budgetary and funding purposes.
business officer	The financial official of the grantee who has primary fiscal responsibility for the grant. Also known as authorized organizational representative.
carryover	Unobligated Federal funds remaining at the end of any budget period that, with the approval of the contracting officer or under an automatic authority, may be carried forward to another budget period to cover allowable costs of that budget period (whether as an offset or additional authorization). Obligated, but unliquidated, funds are not considered carryover.
change in scope	An activity whereby the objectives or specific aims identified in the approved grant application are significantly changed by the grantee after award. Contracting officer prior approval is required for a change in scope to be allowable under an award.
closeout	The process by which a Federal awarding agency determines that all applicable administrative actions and all required work under an award have been completed by the grantee and the Federal awarding agency.
competitive segment	The initial project period recommended for support (up to 5 years) or each extension of a project period resulting from a renewal award.
conference (domestic or international)	A symposium, seminar, workshop, or any other organized and formal meeting, whether conducted face-to-face or via the Internet, where individuals assemble (or meet virtually) to exchange information and views or explore or clarify a defined subject, problem, or area of knowledge, whether or not a published report results from such meeting.
consortium or subaward agreement	A formalized agreement whereby a research project is carried out by the grantee and one or more other organizations that are separate legal entities. Under the agreement, the grantee must perform a substantive role in the conduct of the planned research and not merely serve as a conduit of funds to another party or parties. These agreements typically involve a specific level of effort from the consortium organization's PD/PI and a categorical breakdown of costs, such as personnel, supplies, and other allowable expenses, including F&A costs. The relationship between the recipient and the collaborating organizations is considered a subaward relationship.
consultant	An individual who provides professional advice or services for a fee, but normally not as an employee of the engaging party. In unusual situations, an individual may be both a consultant and an employee of the same party, receiving compensation for some services as a consultant and for other work as a salaried employee. To prevent apparent or actual conflicts of interest, grantees and consultants must establish written guidelines indicating the conditions of payment of consulting fees. Consultants also include firms that provide professional advice or services.
continuation application/award	A financial assistance request (in the form of an application or progress report) or resulting award for a subsequent budget period within a previously approved project period for which a recipient does not have to compete with other applicants.

contract	An award instrument used to acquire from a non-federal party, by purchase, lease, or barter, property or services for the direct benefit or use of the Federal government. The same term may be used to describe a vendor relationship between a recipient and another party under a grant (to acquire routine goods and services); however, the recipient may use subaward to describe the contract under a grant relationship.
Contract (or Grants Management) Officer	A DOE official responsible for the business management aspects of grants and cooperative agreements, including review, negotiation, award, and administration, and for the interpretation of grants administration policies and provisions. COs and GMOs are delegated the authority to obligate DOE to the expenditure of funds and permit changes to approved projects on behalf of DOE.
Contract (or Grants Management) Specialist	A DOE staff member who works with a contract or grants management officer and is assigned the day-to-day management of a portfolio of grants and/or cooperative agreements. These activities include, but are not limited to, evaluating grant applications for administrative content and compliance with statutes, regulations, and guidelines; negotiating grants; providing consultation and technical assistance to grantees; and administering grants after award.
cooperative agreement	A type of financial assistance used when there will be substantial Federal scientific or programmatic involvement. Substantial involvement means that, after award, scientific or program staff will assist, guide, coordinate, or participate in project activities.
cost principles	The government-wide principles, issued by OMB (or, in the case of commercial organizations, the Federal Acquisition Regulation [48 CFR 21], or, in the case of hospitals, 45 CFR 74, Appendix E, "Principles For Determining Costs Applicable to Research and Development Under Grants and Contracts with Hospitals"), on allowability and unallowability of costs under federally sponsored agreements.
cost sharing	The portion of the costs of a project or program not borne by the sponsor; these could be grantee contributions or third-party in-kind contributions; costs used to satisfy cost sharing requirements are subject to the same policies governing allowability as other costs of the project. Research grants are generally not subject to cost sharing requirements. Also known as matching.
deadline	The published date and/or time that a grant application is to be either postmarked/mailed or electronically submitted to the funding agency.
debarment and suspension	The actions taken by a debarring official in accordance with OMB guidance at 2 CFR 180, "Non-procurement Debarment and Suspension," to exclude a person or organization from participating in grants and other non-procurement awards government-wide. If debarred or suspended, the person or organization may not receive financial assistance (under a grant, cooperative agreement, or subaward, or contract under a grant) for a specified period of time. Debarments and suspensions carried out pursuant to 2 CFR 376 are distinct from post-award suspension action by an awarding agency.
direct costs	Costs that can be identified specifically with a particular sponsored project, an instructional activity, or any other institutional activity, or that can be directly assigned to such activities relatively easily with a high degree of accuracy.
disallowance	A charge to a grant that the Federal awarding agency determines to be unallowable in accordance with the applicable Federal cost principles or other terms and conditions contained in the award.
domestic organization	A public (including a State or other governmental agency) or private non-profit or for-profit organization that is located in the United States or its territories, is subject to U.S. laws, and assumes legal and financial accountability for awarded funds and for the performance of the grant-supported activities.
DUNS number	A nine-digit number established and assigned by Dun and Bradstreet to uniquely identify a business entity.
effort	The amount of time, usually expressed as a percentage of the total, which a faculty member or other employee spends on a sponsored project. No one is allowed to spend more than 100% total commitment on all academic activities, including grant-

	sponsored research, university-sponsored research, teaching, administration, advising and other contracted duties. Effort is indicated on the budget in units of person-months.
equipment	An article of tangible nonexpendable personal property that has a useful life of more than 1 year and an acquisition cost per unit that equals or exceeds \$5,000 or the capitalization threshold established by the organization, whichever is less.
expanded authorities	Authorization to grantees under certain research grant mechanisms which waives the requirement for prior agency approval for specified actions related to awards. Example: 90-day pre-award spending authority, no cost extensions for up to one additional year, and automatic carryover of unobligated funds from one budget period to the next. The expanded authorities are now contained in the standard terms and conditions for most research grants.
expiration date	Generally, the date signifying the end of the current project period, after which the grantee is not authorized to obligate grant funds.
facilities and administrative costs	Costs that are incurred by a grantee for common or joint objectives and that, therefore, cannot be identified specifically with a particular project or program. These costs also are known as indirect costs.
Federal Financial Report	Submitted on Standard Form (SF) 425, to indicate the status of awarded funds for the period covered. Frequency of reporting is specified in the Reporting Checklist provided as part of the award documents. Replaces the SF-269 Financial Status Report (FSR)
financial assistance	Transfer by DOE of money or property to an eligible entity to support or stimulate a public purpose authorized by statute.
Financial Status Report	See Federal Financial Report.
foreign travel	Foreign travel includes travel outside of the United States and its territories and possessions (Guam, American Samoa, Puerto Rico, the Virgin Islands, and the Canal Zone) and Canada. A trip is considered foreign travel for all legs of the itinerary if the traveler does not return to his or her post prior to departure for a foreign destination. Costs for foreign travel may be restricted by the language of a Funding Opportunity Announcement.
funding opportunity announcement	A publicly available document by which a Federal Agency makes known its intentions to award discretionary grants or cooperative agreements, usually as a result of competition for funds. Funding opportunity announcements may be known as program announcements, requests for applications, notices of funding availability, solicitations, or other names depending on the Agency and type of program. Funding opportunity announcements can be found at Grants.gov/FIND . An FOA may also be known as a solicitation.
grant	A financial assistance mechanism providing money, property, or both to an eligible entity to carry out an approved project or activity. A grant is used whenever DOE anticipates no substantial programmatic involvement with the recipient during performance of the financially assisted activities.
grant-supported project or activity	Those activities specified or described in a grant application or in a subsequent submission that are approved by DOE for funding, regardless of whether Federal funding constitutes all or only a portion of the financial support necessary to carry them out.
grantee	The organization or individual awarded a grant or cooperative agreement by DOE that is responsible and accountable for the use of the funds provided and for the performance of the grant-supported project or activity. The grantee is the entire legal entity even if a particular component is designated in award documents. The grantee is legally responsible and accountable to DOE for the performance and financial aspects of the grant-supported project or activity. Also known as awardee or recipient.
Grants.gov	Grants.gov (https://www.grants.gov/) has been designated by the Office of Management and Budget as the single access point for all grant programs offered by 26 Federal grant-making agencies. It provides a single interface for agencies to

	announce their grant opportunities and for all applicants to find and apply for those opportunities.
indirect costs	See facilities and administrative costs definition.
institutional base salary	The annual compensation paid by an organization for an employee's appointment, whether that individual's time is spent on research, teaching, patient care, or other activities. Base salary excludes any income that an individual may be permitted to earn outside of duties for the applicant/grantee organization. Base salary may not be increased as a result of replacing organizational salary funds with grant funds.
matching or cost sharing	The value of third-party in-kind contributions and the portion of the costs of a federally assisted project or program not borne by the Federal government. Matching or cost sharing may be required by statute or program regulation. Costs used to satisfy matching or cost-sharing requirements are subject to the same policies governing allowability as other costs under the approved budget.
merit (or peer) review	The process that involves the consistent application of standards and procedures that produce fair, equitable, and objective examinations of applications based on an evaluation of scientific or technical merit or other relevant aspects of the application. The review is performed by experts (reviewers) in the field of endeavor for which support is requested. Merit review is intended to provide guidance and to the DOE individuals responsible for making award decisions.
monitoring	A process whereby the programmatic and business management performance aspects of a grant are assessed by reviewing information gathered from various required reports, audits, site visits, and other sources.
no-cost extension	An extension of time to a project period and/or budget period to complete the work of the grant under that period, without additional Federal funds or competition.
non-Federal share	When cost sharing or matching is required as a condition of an award, the portion of allowable project/program costs not borne by the Federal government.
Notice of Financial Assistance Award obligations	See award documents
Other Significant Contributors	The amounts for which the recipient has made binding commitments for orders placed for property and services, contracts and subawards, and similar transactions during a funding period that will require payment during the same or a future period. Individuals who have committed to contribute to the scientific development or execution of the project, but are not committing any specified measurable effort (i.e., person months) to the project. These individuals are typically presented at "effort of zero person months" or "as needed." Individuals with measurable effort may not be listed as Other Significant Contributors (OSCs). Consultants should be included if they meet this definition.
participant	Program participants are the recipients of service or training provided at a workshop, conference, seminar, symposium or other short-term instructional or information-sharing activity funded by an external grant or award, or the training beneficiaries of the project or program funded by an external grant or award. A participant is not involved in providing any deliverable to the grantee or a third party or would not be terminated or replaced for failure to perform.
participant costs	Costs used to pay program participants small stipends and reimbursement of travel costs or other out-of-pocket costs incurred to support attendance at a workshop, conference, seminar, symposium, or other short-term training or information-sharing activity.
person months	The metric for expressing the effort (amount of time) PD/PI(s), faculty and other senior/key personnel devote to a specific project. The effort is based on the type of appointment of the individual with the organization; e.g., calendar year, academic year, and/or summer term; and the organization's definition of such. For instance, some institutions define the academic year as a 9-month appointment while others define it as a 10-month appointment.
pre-application or pre-proposal	A brief outline or narrative of proposed work and sometimes budget, for informal review by a sponsor to determine whether a full application should be submitted.

Three predominant reasons for requiring submission of a preliminary pre-application are:

- Reduce the applicant's unnecessary effort in proposal preparation when the chance of success is very small. This is particularly true of exploratory initiatives where the community senses that a major new direction is being identified, or competitions that will result in a small number of actual awards.
- Increase the overall quality of the full submission.
- Distill the number of applications that will be submitted to the agency and the number of anticipated reviewers needed to review.

pre-award costs	Any cost incurred prior to the beginning date of the project period or the initial budget period of a competitive segment (under a multi-year award), in anticipation of the award and at the applicant's own risk, for otherwise allowable costs.
prior approval	Written approval from the designated contracting officer required for specified post-award changes in the approved project or budget. Such approval must be obtained before undertaking the proposed activity or spending DOE funds
Program Director/ Principal Investigator	The individual(s) designated by the applicant organization to have the appropriate level of authority and responsibility to direct the project or program to be supported by the award. The applicant organization may designate multiple individuals as program directors/principal investigators (PD/PIs) who share the authority and responsibility for leading and directing the project, intellectually and logistically. When multiple PD/PIs are named, each is responsible and accountable to the applicant organization, or as appropriate, to a collaborating organization for the proper conduct of the project or program including the submission of all required reports. The presence of more than one PD/PI on an application or award diminishes neither the responsibility nor the accountability of any individual PD/PI.
program income	Program income is gross income earned by a research grant recipient from the activities, part or all of which are borne as a direct cost by the grant. Examples are fees for services performed under the grant, rental or usage fees charged for use of equipment purchased with grant funds, third party patient reimbursements for hospital or medical services paid from the grant, funds generated by the sale of commodities, such as cell lines or research animals developed from or paid for from the grant, and patent or copyright royalties.
Program Manager	The DOE official responsible for the programmatic, scientific, and/or technical aspects of a grant. The same role is filled by Program Directors, Program Officers, or Project Directors at other Federal agencies.
progress report	Periodic, frequently annual, report submitted by the grantee and used by DOE to assess progress and to determine whether to provide funding for the budget period subsequent to that covered by the report.
project/performance site	Location(s) of where the work described in the research plan will be conducted.
project period	The total time for which Federal support of a project has been programmatically approved as shown in the award documents; however, it does not constitute a commitment by the Federal government to fund the entire period. The total project period comprises the initial competitive segment, any subsequent competitive segments resulting from a renewal award(s), and extensions.
proposal re-budgeting	See application. Reallocation of funds available for spending between budget categories to allow best use of funds to accomplish the project goals.
recipient renewal application	The organizational entity or individual receiving a grant or cooperative agreement. An application requesting additional funding for a period subsequent to that provided by a current award. Renewal applications compete for funds with all other peer reviewed applications and must be developed as fully as though the applicant is applying for the first time.
research	A systematic, intensive study intended to increase knowledge or understanding of the subject studied, a systematic study specifically directed toward applying new

	knowledge to meet a recognized need, or a systematic application of knowledge to the production of useful materials, devices, and systems or methods, including design, development, and improvement of prototypes and new processes to meet specific requirements. Also termed “research and development.”
research misconduct	Fabrication, falsification, plagiarism, or other practices that seriously deviate from those that are commonly accepted within the scientific community in proposing, performing, or reporting research, or in reporting research results; does not include honest error or honest differences in interpretations or judgments of data.
SAM.gov	The System for Award Management (SAM) is the Government-wide system that consolidated the Central Contractor Registration (CCR), the Excluded Parties List System (EPLS), the Online Representations and Certifications Application (ORCA), and the Federal Agency Registration (FedReg).
scope of work	The aims, objectives, and purposes of a grant; as well as the methodology, approach, analyses or other activities; and the tools, technologies, and timeframes needed to meet the grant’s objectives. This includes the research or training plan included with the original grant application, along with any approved modifications.
Senior/Key Personnel	The PD/PI and other individuals who contribute to the scientific development or execution of a project in a substantive, measurable way, whether or not they receive salaries or compensation under the grant. Typically these individuals have doctoral or other professional degrees, although individuals at the masters or baccalaureate level may be considered senior/key personnel if their involvement meets this definition. Consultants and those with a postdoctoral role also may be considered senior/key personnel if they meet this definition. “Zero percent” effort or “as needed” is not an acceptable level of involvement for Senior/Key Personnel.
significant rebudgeting	A threshold that is reached when expenditures in a single direct cost budget category deviate (increase or decrease) from the categorical commitment level established for the budget period by more than 25 percent of the total costs awarded. Significant rebudgeting is one indicator of change in scope.
small business concern	A business that is independently owned and operated and not dominant in its field of operation; has its principal place of business in the United States and is organized for profit; is at least 51 percent owned, or in the case of a publicly owned business, at least 51 percent of its voting stock is owned by U.S. citizens or lawfully admitted permanent resident aliens; has, including its affiliates, not more than 500 employees; and meets other regulatory requirements established by the SBA at 13 CFR 121.
solicitation subaward	See Funding Opportunity Announcement A legal instrument by which a recipient provides funds (or property in lieu of funds) to an eligible sub-recipient (or a lower-tier transaction) to perform a substantive portion of the grant-supported program or project. The term includes such financial assistance when provided by any legal agreement (even if the agreement is called a contract) but does not include any form of assistance which is excluded from the definition of a grant, including the recipient’s procurement of property or services needed to carry out the project or program. The term includes consortium agreements.
sub-recipient	A party that receives a subaward from a recipient or another sub-recipient under a Federal financial assistance award and is accountable to the recipient or sub-recipient for the use of the Federal funds provided by the subaward.
supplement	A request for an increase in support during a current budget period for expansion of the project’s scope or to meet increased costs unforeseen at the time of the new or renewal application. A supplement may increase support for future years in addition to the current year. Supplements require applications and are subject to administrative and merit review.
terms and conditions of award	All legal requirements imposed on a grant by DOE, whether based on statute, regulation, policy, or other document referenced in the grant award, or specified by the grant award document itself. The award documents may include both standard and special conditions that are considered necessary to attain the grant’s objectives, facilitate post-award administration of the grant, conserve grant funds, or otherwise

unallowable costs	protect the Federal government's interests. Specific categories of costs that cannot be charged, directly or indirectly, to federally sponsored agreements in accordance with federal regulations or the terms and conditions of the award.
unliquidated obligation	For reports prepared on a cash basis, the amount of obligations incurred by the recipient that has not been paid; or For reports prepared on an accrued expenditure basis, the amount of obligations incurred by the recipient for which an outlay has not been recorded.
unobligated balance	The portion of the funds authorized by the Federal agency for expenditure by the recipient that has not been obligated by the recipient.
Validate	In the context of the data management plan requirements, <i>validate</i> means to support, corroborate, verify, or otherwise determine the legitimacy of the research findings. Validation of research findings could be accomplished by reproducing the original experiment or analyses, comparing and contrasting the results against those of a news experiment or analyses, or by some other means.