

**FINANCIAL ASSISTANCE  
FUNDING OPPORTUNITY ANNOUNCEMENT**



**U.S. Department of Energy  
Office of Science  
High Energy Physics**

**DOE Traineeship in Accelerator Science & Engineering**

**Funding Opportunity Number: DE-FOA-0001782  
Announcement Type: Initial  
CFDA Number: 81.049**

<b>Issue Date:</b>	<b>06/16/2017</b>
<b>Pre-Application Due Date:</b>	<b>06/26/2017 at 5 PM Eastern Time (A Pre-Application is required)</b>
<b>Encourage/Discourage Date:</b>	<b>06/30/2017 at 5 PM Eastern Time</b>
<b>Application Due Date:</b>	<b>07/31/2017 at 5 PM Eastern Time</b>

## Table of Contents

UPDATES AND REMINDERS.....	I
SECTION I – FUNDING OPPORTUNITY DESCRIPTION.....	1
SECTION II – AWARD INFORMATION.....	11
A. TYPE OF AWARD INSTRUMENT.....	11
B. ESTIMATED FUNDING .....	11
C. MAXIMUM AND MINIMUM AWARD SIZE.....	11
D. EXPECTED NUMBER OF AWARDS.....	11
E. ANTICIPATED AWARD SIZE .....	11
F. PERIOD OF PERFORMANCE .....	11
G. TYPE OF APPLICATION .....	12
H. VALUE/FUNDING FOR DOE/NNSA NATIONAL LABORATORY CONTRACTORS AND NON-DOE/NNSA FFRDC CONTRACTORS.....	12
I. RESPONSIBILITY .....	12
SECTION III – ELIGIBILITY INFORMATION .....	13
A. ELIGIBLE APPLICANTS .....	13
B. COST SHARING.....	14
C. TRAINEESHIP PARTNERS.....	14
SECTION IV – APPLICATION AND SUBMISSION INFORMATION .....	16
A. ADDRESS TO REQUEST APPLICATION PACKAGE.....	16
B. LETTER OF INTENT AND PRE-APPLICATION.....	16
C. CONTENT AND APPLICATION FORMS.....	21
D. SUBMISSIONS FROM SUCCESSFUL APPLICANTS.....	36
E. SUBMISSION DATES AND TIMES .....	36
F. INTERGOVERNMENTAL REVIEW.....	37
G. FUNDING RESTRICTIONS .....	37
H. OTHER SUBMISSION AND REGISTRATION REQUIREMENTS .....	38
SECTION V - APPLICATION REVIEW INFORMATION.....	45
A. CRITERIA .....	45
B. REVIEW AND SELECTION PROCESS .....	47
C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES .....	49
SECTION VI - AWARD ADMINISTRATION INFORMATION .....	50

A. AWARD NOTICES.....	50
B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS.....	50
C. REPORTING .....	53
SECTION VII - QUESTIONS/AGENCY CONTACTS.....	54
A. QUESTIONS .....	54
B. AGENCY CONTACTS.....	54
SECTION VIII - OTHER INFORMATION .....	55
A. MODIFICATIONS .....	55
B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE.....	55
C. COMMITMENT OF PUBLIC FUNDS.....	55
D. PROPRIETARY APPLICATION INFORMATION .....	55
E. EVALUATION AND ADMINISTRATION BY NON-FEDERAL PERSONNEL .....	56
F. INTELLECTUAL PROPERTY DEVELOPED UNDER THIS PROGRAM.....	56
G. NOTICE OF RIGHT TO REQUEST PATENT WAIVER.....	56
H. NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES .....	57
I. AVAILABILITY OF FUNDS .....	57
J. ENVIRONMENTAL, SAFETY AND HEALTH (ES&H) PERFORMANCE OF WORK AT DOE FACILITIES.....	57
K. NATIONAL ENVIRONMENTAL POLICY ACT COMPLIANCE.....	57
SECTION IX - APPENDICES/REFERENCE MATERIAL .....	58

## **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 (DOE) Financial Assistance Rules, and 10 CFR 605, the Office of Science Financial Assistance Program.

### DATA MANAGEMENT PLAN

The Office of Science has published a new Statement on Digital Data Management, published at <http://science.energy.gov/funding-opportunities/digital-data-management/>, which governs applications submitted under this FOA, and is detailed in Part IV of this FOA.

### 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/rppr/>. 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>) thirty 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 actual 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.
- 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.
- Please ensure that the budget is calculated using the applicable negotiated indirect cost and fringe benefit rates.

## RECOMMENDATION

The Office of Science encourages you to register in all systems as soon as possible. You are also encouraged to submit pre-applications, and applications well before the deadline.

## **Section I – FUNDING OPPORTUNITY DESCRIPTION**

### **GENERAL INQUIRIES ABOUT THIS FOA SHOULD BE DIRECTED TO:**

#### **Technical/Scientific Program Contact:**

Dr. Eric R. Colby  
301-903-5475  
Eric.Colby@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 DOE Traineeship in Accelerator Science and Engineering provides support to address critical, targeted workforce development in fields of study that are currently supported by U.S. Department of Energy (DOE) research awards. Up to two Cooperative Agreements may provide funding to universities or consortia of universities for up to two years of tuition, stipend, and travel support to students enrolled in specific accelerator science and engineering degree programs, and to provide a modest topic-specific curriculum development and program administration support. Award term is expected to be up to five years, with the possibility of renewal for a second term. This program does **not** support lines of Research and Development (R&D). Support for accelerator R&D is provided through the High Energy Physics (HEP) General Accelerator R&D and Accelerator Stewardship programs, through accelerator R&D programs elsewhere in DOE, and by other federal agencies.

This program is to assist domestic institutions of higher education in enhancing their graduate-level educational efforts to ensure that a diverse and highly trained future population of scientists is available to conduct cutting-edge research in the basic sciences. By training the scientists of the future, this program will ensure the continued vitality of U.S. scientific endeavors that will create knowledge for the public benefit.

## SUPPLEMENTARY INFORMATION

### Background and Workforce Development Need

Accelerators play a key role in the discovery sciences, including High Energy Physics (HEP), Nuclear Physics (NP), and Basic Energy Sciences (BES). Modern discovery science accelerators are high technology instruments of remarkable complexity, having advanced over eight orders of magnitude in energy since their invention. Aggressive reinvention of the underlying technology has driven improvements in this science, and has required sustained investment in R&D that advances the methods, materials, and understanding of accelerator science.

Accelerator Science is an interdisciplinary field that encompasses the design and improvement of particle accelerators, the development of new methods of charged particle production and manipulation, and the development of unique supporting technologies needed for accelerators. Significant career specialization has evolved as the demand for ever greater performance has required reaching deep into mathematics, computation, materials science, plasma science, radio frequency technology, superconducting materials, laser engineering, and a variety of other disciplines.

National laboratories, academia, and industry each play vital, mutually-reinforcing roles in the success of the accelerator-based discovery sciences, and in providing the scientific and technological advances necessary to sustain U.S. leadership in this area. With an estimated 30,000 particle accelerators operating worldwide, there is a significant—and growing—need<sup>1</sup> for a technically competent workforce that can design, install, operate, upgrade, and repair accelerators.

A 2014 High Energy Physics Advisory Panel subcommittee on HEP Workforce Development Needs identified a deficit in the accelerator science workforce as an area of special concern, both for its impact on the Office of Science (SC)'s statutorily-defined research activities, and for its broader consequences.<sup>2,3</sup> This deficit was further underscored by the 2015 High Energy Physics Advisory Panel (HEPAP) Subcommittee report on the Review of the United States Particle Accelerator School (USPAS).<sup>4</sup> Approximately 10–12 accelerator science PhDs graduate each year in the U.S., nearly an order of magnitude less than Europe. This is traceable to the small number of U.S. universities that have accelerator faculty and offer instruction in accelerator science.

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1 “Accelerators for America’s Future”, workshop report, <http://science.energy.gov/~media/hep/pdf/accelerator-rd-stewardship/Report.pdf>, (2009).

2 “OHEP Workforce Development”, Report presented to HEPAP May 22, 2014, [http://science.energy.gov/~media/hep/hepap/pdf/May%202014/Patterson\\_HEPAP\\_DOEWorkforce\\_v1-1.pdf](http://science.energy.gov/~media/hep/hepap/pdf/May%202014/Patterson_HEPAP_DOEWorkforce_v1-1.pdf).

3 “HEP Workforce Development Needs”, report of the HEPAP subcommittee, June 30, 2014, [http://science.energy.gov/~media/hep/hepap/pdf/Reports/OHEP\\_Workforce\\_Letter\\_Report.pdf](http://science.energy.gov/~media/hep/hepap/pdf/Reports/OHEP_Workforce_Letter_Report.pdf).

4 [https://science.energy.gov/~media/hep/hepap/pdf/Reports/HEPAP\\_USPAS\\_Subcommittee\\_Final\\_Report.pdf](https://science.energy.gov/~media/hep/hepap/pdf/Reports/HEPAP_USPAS_Subcommittee_Final_Report.pdf).

A 2015 Request For Information (RFI)<sup>5</sup> yielded information about the critical role played by the USPAS in preparing the accelerator workforce, and about the additional unmet needs to encourage scientists and engineers to enter specific topical areas in accelerator science and engineering. The RFI also identified the need to provide mechanisms to facilitate access to, and increase personnel exchanges with, the National Laboratories.<sup>6</sup> It is the purpose of the DOE Traineeship in Accelerator Science and Engineering to address these workforce development needs.

## **DOE Traineeship Program Description**

The purpose of this FOA is to address the shortfall in critical topic areas by awarding one or more cooperative agreements (anticipated to be for a term up to five years) to accredited U.S. Colleges and Universities (hereafter referred to as “Universities”) to train graduate students in specific disciplines or sub-disciplines aligned with the area of Accelerator Science & Engineering, particularly as they apply to the mission-space of the DOE Office of Science (SC) program in High Energy Physics.

This DOE Traineeship program will support innovative, university-led proposals for graduate level training that leverage DOE assets, capabilities, and strategic partnerships, and address emerging needs in graduate training to enable preparedness for STEM careers beyond academia in topics supported by DOE research awards. This will be accomplished through a focused academic graduate program that delivers unique, innovative curriculum, coupled with a rigorous thesis or dissertation research requirement, in the desired scientific or technical discipline(s).

The Office of Science generally and HEP specifically use large particle accelerators as tools to conduct scientific research. In HEP, accelerators are used to study the elementary constituents of matter and energy, the interactions between them, and the nature of space and time.

Accelerators built for this purpose are first-of-kind machines employing state-of-the-art accelerator technology on a very large scale. A combination of scientists and engineers trained specifically in the physics and technology is needed to design, build, and operate these machines. While SC continues to plan ever more advanced accelerators to support its mission, difficulties hiring qualified scientists and engineers are expected to worsen as growing competition from European and Asian accelerator projects draw away critical talent. This DOE Traineeship program will help address these issues and enable continued success in domestic scientific discovery.

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<sup>5</sup> “Strengthening U.S. Academic Programs in Accelerator Science”, Federal Register, Doc. 2015-11664, Vol. 80, No. 93, p. 27678ff (2015).

<sup>6</sup> Cataloged responses to the RFI are available at: [https://science.energy.gov/~media/hep/pdf/accelerator-rd-stewardship/AcadAccelSciRFI\\_CatalogOfResponses.pdf](https://science.energy.gov/~media/hep/pdf/accelerator-rd-stewardship/AcadAccelSciRFI_CatalogOfResponses.pdf).

## Critical Workforce Needs in Accelerator Science and Engineering

Present trends indicate that there will be a shortage of U.S. scientists conducting research and related activities using accelerators to advance the boundaries of scientific knowledge. Critical workforce shortages in four areas of accelerator science and engineering have been identified as adversely impacting the research community supported by SC:

- 1. Physics of large accelerators and systems engineering**  
Opportunities for graduate research that lead to a system-wide hands-on experience with large accelerators are comparatively rare. Scientists and engineers prepared to take on system-wide design, optimization, diagnosis, operation, and upgrade planning for large accelerators are needed. A broad range of skills is required, including: beam physics at the systems level, a broad and substantive knowledge of the technologies of large accelerators, engineering expertise in high reliability design and failure analysis, and knowledge of the fundamentals of project management.
- 2. Superconducting radiofrequency accelerator physics and engineering**  
Current and next generation machines require R&D to develop the material science, design methodology, fabrication techniques, and operations expertise needed to produce and operate superconducting radiofrequency accelerators. Scientists and engineers prepared to take on the full range of research and engineering challenges are needed.
- 3. Radiofrequency power system engineering**  
The production, control, and transmission of radiofrequency (RF) power is needed for the majority of accelerators and RF power consumption is typically a large component of operations cost. Engineers or engineering physicists prepared to design, build, diagnose, and maintain efficient, high reliability high power RF systems are needed.
- 4. Cryogenic systems engineering (especially liquid helium systems)**  
The engineering of large-scale cryogenic systems—particularly liquid helium systems—is critical to superconducting accelerator technology. Engineers or engineering physicists prepared to design, fabricate, and operate large one-of-a-kind cryogenic systems are needed.

Note that the topics above require a skilled workforce. Applications to this Announcement must address one or more of the four targeted areas described above. The DOE Traineeship program in accelerator science and engineering will support students *only if pursuing a degree specialization in one of these four identified areas of critical need*. Training of physicists and engineers in other topical areas may be supported by other programs, such as through the HEP General Accelerator R&D Program, the Accelerator Stewardship program, the accelerator R&D programs of other Offices of Science, or the National Science Foundation (NSF) Accelerator Science program.

## **Traineeship Program Objectives and Requirements**

The **objectives** of DOE Traineeship in Accelerator Science & Engineering are to support the training of the next generation of STEM professionals at Universities through the following objectives:

- Ensure the future strength and diversity of the Nation's population of scientists by advancing specific STEM workforce competencies required to ensure America's security and prosperity by addressing its science and technology challenges; and,
- Address priority workforce needs and identified gaps by advancing those critical disciplines and competencies specifically relevant to a program of basic research in the physical sciences where other development programs do not exist or where applications are not being leveraged to support the future population of scientists that will perform research within DOE's currently-supported fields of study.

DOE's Traineeships are guided by the following **key principles**:

- DOE Traineeship programs will be University-led, targeted training opportunities.
- DOE Traineeships will not duplicate the efforts of other Federal agencies and will leverage DOE assets and capabilities where beneficial and practicable. It is expected that the successful DOE Traineeship program(s) will make effective use of the United States Particle Accelerator School (USPAS), where appropriate, to enhance students' preparation.
- As DOE Traineeships provide only modest R&D support (see Section I, Part C below), it is expected that the successful program(s) will leverage existing R&D programs in the specified topic area(s). It is expected that the strongest Traineeship program(s) will function as an "overlay" on a strong scientific R&D collaboration with one or more DOE National Laboratories in a mutually reinforcing manner (see Section I, Part B below).
- STEM training areas to be addressed in DOE Traineeships are derived from an evidence-based assessment of the future workforce needs in fields supported by DOE awards.
- Cooperative Agreements resulting from this FOA will be established following best practices for open, competitive solicitation processes, including rigorous external peer review using established merit review criteria specified in the FOA.
- DOE and the Universities will develop rigorous evaluation plans for Traineeship programs that will include clear program goals and mechanisms for tracking program outcomes and evaluating program success.

Traineeship awards made under this FOA are for institutions of higher education that support the specialized training of graduate students (Masters and Ph.D. students) in the critical areas of accelerator science and engineering identified above. This specialized training includes training beyond traditional research and laboratory skills. The awards will offset the cost of stipends, tuition and fees, and training related expenses for appointed trainees. The awards will not typically pay for institutional personnel salaries, but very limited faculty salary support may be allowed in some instances; traineeship awards may provide limited support for staff time for new curriculum development.

Students must be enrolled in a Qualified Graduate Program in:

- accelerator science, or
- physics, with specialization in accelerator science, or
- applied physics, with specialization in accelerator science, or
- engineering, with a specialization in accelerator engineering.

The awarded institution is responsible for:

- Establishing an application/selection process for student trainee candidates,
- Implementing the training program as described in this FOA and the awarded application, and,
- Implementing measures to evaluate the effectiveness of the training program.

Individual Universities may apply or a consortium of Universities may apply. Please note, however, that the enrollment requirement is **three to six new students enrolled every year**, with the DOE Traineeship providing support for up to two years per student. Students must pursue degrees in one of the critical topical areas defined above.

The following sections describe requirements that are common to the DOE Traineeship programs, including this specific program in Accelerator Science and Engineering.

#### A. Required Program Elements

1. Overall, a DOE Traineeship program shall support:
  - i. One or more five-year proposals from universities or consortia proposing to train graduate students in specific disciplines or sub-disciplines aligned with DOE STEM workforce needs. The Program retains the option to renew or re-compete the awards after five years<sup>7</sup> in order to develop an enduring institutional capacity for graduate training in areas of demonstrated need.
  - ii. Proposals should target support for two years of a graduate student's Ph.D. level training, but could also support graduate students pursuing a terminal Master's degree if the Master's degree requires a thesis project. Traineeship programs at a given academic institution should be relatively small and focused, supporting three to six new students per year, with a total of six to twelve students per year supported after the first year.
  - iii. The DOE traineeship program will include a combination of targeted, relevant and innovative STEM course work, mentored graduate research, and other required activities. Such activities designed to address essential knowledge and skills and to leverage DOE capabilities and assets, could include focused workshops; seminars; research practicums at a DOE laboratory or other DOE-supported assets; internships with strategic partners; or participation in external courses and programs.
  - iv. The graduate training program should also include structured support for graduate

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<sup>7</sup> HEP may conduct an external progress review in year three to inform the decision to fund the remainder of the 5-year award period.

- student professional development in non-research skills, including but not limited to project management, oral and written science communication, developing and working within large collaborations (team science), and entrepreneurial skills.
- v. Proposals for graduate traineeships should clearly describe the planned curriculum for graduate training, and describe any proposed new curriculum development where new courses, workshops, etc. are needed as part of the traineeship program of study. Traineeship awards may provide limited support for staff time for new curriculum development.
2. Proposals must include the following content:
    - i. Detailed information about planned curricula, including courses, workshops and seminars, research experiences, and mentoring that will be incorporated into the proposed DOE traineeship program. For consortium proposals, include a description of how the consortium structure enhances the breadth and depth of the traineeship experience and adds value. See Section IV, Parts B and C.
    - ii. Plans for new curriculum development to meet the scientific and technical training needs specified in the FOA. Courses provided by the USPAS should be incorporated into the curriculum where appropriate.
    - iii. Explanation of how the proposed training program will specifically address the DOE critical workforce training needs specified above.
    - iv. At least one of the DOE-focused Program Elements described in Section I, Part B below.
    - v. A rigorous evaluation plan that explains how the Awardee will review and assess the quality of the trainee program and the overall impact of the trainee program on the workforce training goal of the Office of High Energy Physics. Such a plan is expected to include the following elements, among others:
      - a) The lead university will be responsible for collecting pre- and post-participation questionnaires from all students in the DOE Traineeship program, with the goal of measuring the change in career goals of the participants, and with other evaluation goals to be discussed with HEP as the program evolves.
      - b) The lead university will be responsible for collecting career placement data on DOE Traineeship participants, at a minimum recording the location of first employment following completion of the degree including information about each student's first permanent placement whenever possible.
    - vi. Acknowledgement of the requirements for eligible graduate students, mentors, and academic institutions as outlined in Section I, Part 3a) below.
  3. Proposals should appropriately define the eligibility requirements for graduate student trainees, mentors, and academic institutions.
    - i. *Requirements for Graduate Student Trainees:* To be eligible to participate in the university-led traineeship program, graduate student candidates must:
      - a) Be a U.S. citizen or a legal permanent resident.
      - b) Be at least 18 years of age.
      - c) Be enrolled full-time in a qualified graduate program<sup>8</sup> at an accredited academic

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<sup>8</sup> Qualified graduate programs are defined in Section I above

institution either pursuing a Ph.D. or a Master's degree as their degree objective. A Master's degree-level traineeship program must require a thesis project to be eligible.

- d) Conduct graduate research aligned with the STEM discipline(s) defined in the FOA.
- e) Be able to meet the traineeship program requirements specified in the proposal.
- ii. *Requirements for Mentors:* Eligible mentors from the host university and from partner institutions should be qualified researchers or related subject matter experts with a strong record of performance, including a record of publications, and a favorable record in training and mentoring students at the graduate level.
- iii. *Requirements for Academic Institutions:* Proposals must be submitted by qualified individuals from eligible institutions of higher education who are established researchers with demonstrated scientific and administrative leadership skills. Eligible institutions include academic institutions of higher education with accredited graduate programs granting Masters and Ph.D. degrees in STEM fields aligned with the workforce training needs of the sponsoring DOE Program Office. Successful proposals will be expected to share information regarding innovative curriculum that addresses the targeted science and/or engineering training needs developed under the DOE Traineeship award.

#### **B. Requirement for DOE-Focused Program Elements**

To help establish DOE Traineeships programs that focus on critical STEM disciplines and competencies specifically relevant to fields of study currently supported by DOE research awards, proposals responsive to FOAs for DOE Traineeships will require the inclusion of at least one of the following DOE-focused program elements:

##### **1. Partnership with a DOE National Laboratory.**

Universities may propose to partner with one or more DOE national laboratories to incorporate program elements that enhance the quality of the training program and specifically address the DOE STEM discipline training sought by the DOE Program Office as described in this FOA. The required structured program elements for graduate trainees carried out in partnership with a DOE national laboratory can include:

- i. Long-term or short-term research internships at a DOE national laboratory in collaboration with DOE laboratory scientists or engineers;
  - ii. Laboratory practicums that occur at a DOE national laboratory in collaboration with DOE laboratory scientists or engineers;
  - iii. Scientific or technical workshops at a DOE laboratory that hosts unique research capabilities or facilities relevant to the target STEM discipline area;
  - iv. Focused long-term or short-term summer credit-bearing courses at a DOE laboratory that offers unique research capabilities or facilities related to the target STEM discipline area; or
  - v. Workshops related to professional development skills critical to a broader range of career options, including research project management, construction project management, entrepreneurial skills, science communication, technology transfer, or related regulatory requirements.
2. Partnership with a private sector for-profit or non-profit organization currently sponsored

by DOE.

Universities may propose to partner with one or more DOE-sponsored private sector organizations. This would help incorporate elements that enhance the quality of the training program and specifically address the DOE STEM discipline training sought by the DOE Program Office, as described in this FOA. Required, structured program elements for graduate trainees carried in partnership with a private sector organization can include:

- i. Research internships at the organization;
  - ii. Scientific or technical workshops at a partner organization hosting unique research capabilities or facilities related to the target STEM discipline area;
  - iii. Workshops related to professional development skills critical to a broader range of career options, including research project management, construction project management, entrepreneurial skills, science communication, technology transfer, or related regulatory requirements that can be uniquely provided by the organization.
3. Partnership with a non-DOE-sponsored public or private sector organization to address a specific DOE workforce training need.

Sponsoring DOE Program Offices may include an option for the university to propose unique partnerships with non-DOE sponsored public or private sector organizations to carry out activities that enhance the overall training program to meet the specified DOE workforce training need defined in the FOA.

### **C. Requirements on Use of Funding**

DOE Traineeship programs will support innovative proposals for graduate level training that leverage DOE assets and capabilities and strategic partnerships, and address emerging needs in graduate training to enable preparedness for STEM careers beyond those in academia. The DOE award is intended to offset the costs of graduate student stipends, tuition, fees and training related expenses for the appointed graduate student trainees.

The proposed budget must adhere to the following guidelines:

1. The overall funding per award should be limited to no more than \$1 million per year.
2. Generally, proposal budgets should provide for program support that is equivalent to no more than \$55,000 per student per year. Funding should provide for monthly stipends, supplemental support for university tuition and fees, travel related to the scope of the training program, and other training related expenses. The \$55,000 per student per year assumes 12-month student participation, a \$30,000-\$35,000 stipend per year, and no more than \$2,000-\$3,000 for traineeship-related travel per student per year. The remainder should provide for associated costs to carry out the scope of the training program, including partnership costs, limited equipment, program evaluation efforts, and/or supplemental support for tuition and fees for the student.
3. Awards should support three to six new students per year, with a total of six to twelve students supported each year after the first year.
4. The university should expect to share any additional tuition or fee costs required by the graduate student and cost of staff time.

Generally, DOE Traineeship awards will not support institutional personnel salaries. A limited amount of funding in the overall budget may be used for staff time under circumstances where research or technical staff is developing new training related curriculum, workshops, or courses. Allowable costs must comply with the cost principles of 2 CFR 200 as modified by 2 CFR 910.

NOTE: The term “applicant” as used in this FOA means Universities that submit an application to DOE in response to this FOA; it does not refer to students who apply for traineeships under the DOE Traineeship in Accelerator Science & Engineering.

Also, the term “application” as used in this FOA refers to the application provided in response to the FOA made by Universities; it does not refer to individual traineeship applications by students to apply for funds from the University-managed traineeship program.

Also, the term “mission-space” as used in this FOA refers to the academic, scientific, and technical fields that lie within DOE’s authority to support. The Energy Policy Act of 2005 notes that the Office of Science shall conduct “programs of research, development, demonstration, and commercial application in high energy physics, nuclear physics, biological and environmental research, basic energy sciences, advanced scientific computing research, and fusion energy sciences, including ... support for facilities and infrastructure, education, outreach, information, analysis, and coordination activities.”

## **Section II – AWARD INFORMATION**

### **A. TYPE OF AWARD INSTRUMENT**

DOE anticipates awarding cooperative agreements under this FOA.

### **B. ESTIMATED FUNDING**

It is anticipated that the total value of any awards resulting from this FOA will be no more than \$1 million.

Approximately \$1 million is expected to be available for new awards in Fiscal Year 2017 (FY2017). Funding for all awards is contingent upon the availability of funds appropriated by Congress for the purpose of this program. The overall funding per award is limited to no more than \$1 million.

DOE is under no obligation to pay for any costs associated with preparation or submission of applications. 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:**

\$1,000,000

**Floor:**

\$1

### **D. EXPECTED NUMBER OF AWARDS**

DOE plans up to two awards from this FOA.

### **E. ANTICIPATED AWARD SIZE**

The overall funding per award is anticipated to be no more than \$1 million. There is no set limitation on the number of students who apply for traineeships who may be accepted at a particular University under these cooperative agreements (See Section I, Part C.).

### **F. PERIOD OF PERFORMANCE**

DOE anticipates making awards to selected school(s) that will run for up to five years for awarding new traineeship funds. DOE retains the option to renew or re-compete the award at the end of the award term period of performance. Each traineeship is expected to run from one to two years. For example, the first class of trainees will complete the traineeship two years into the award period of performance. The second class of trainees will complete the traineeship in the

third year of the award's period of performance, and so on until the fourth class of trainees will complete the traineeship at the end of the award's fifth year of performance.

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

## **G. TYPE OF APPLICATION**

DOE will accept only new applications under this FOA.

## **H. VALUE/FUNDING FOR DOE/NNSA NATIONAL LABORATORY CONTRACTORS AND NON-DOE/NNSA FFRDC CONTRACTORS**

For financial assistance awards, the value of, and funding for, a DOE/National Nuclear Security Agency (NNSA) National Laboratory contractor, a non-DOE/NNSA Federally-Funded Research and Development Center (FFRDC) contractor, or another Federal agency's portion of the work will not be included in the award to the successful applicant. DOE will fund a DOE/NNSA National Laboratory contractor through the DOE fieldwork authorization system or other appropriate process and will fund non-DOE/NNSA FFRDC contractors and other Federal agencies through an interagency agreement in accordance with the Economy Act, 31 U.S.C. 1535, or other statutory authority.

## **I. RESPONSIBILITY**

The successful prime applicant/awardee (lead organization) will be the responsible authority regarding the settlement and satisfaction of all contractual and administrative issues, including but not limited to, disputes and claims arising out of any agreement between the applicant and any team member, and/or subawardee.

If an award is made to a DOE/NNSA National Laboratory, all Disputes and Claims will be resolved in accordance with the terms and conditions of the DOE/NNSA National Laboratory's management and operating (M&O) contract, as applicable, in consultation between DOE and the prime awardee.

If an award is made to another Federal agency or its FFRDC contractor, all Disputes and Claims will be resolved in accordance with the terms and conditions of the interagency agreement in consultation between DOE and the prime awardee.

## Section III – ELIGIBILITY INFORMATION

### A. ELIGIBLE APPLICANTS

In accordance with 2 CFR 910.126(b), eligibility for award is restricted to U.S. accredited institutions of higher education with graduate programs of study in physics, applied physics, accelerator science, and/or engineering, and with at least one faculty member working specifically in the field of accelerator physics.

Minority serving institutions (e.g., Historically Black Colleges and Universities (HBCUs), Black-serving non-HBCUs, Hispanic-serving institutions, Asian-serving institutions, and American Indian-serving institutions) with these types of graduate study programs are encouraged to apply. Universities with cooperative programs, which share coursework between two or more colleges and universities to meet the above requirements are also encouraged to apply.

#### INCORPORATED CONSORTIA

Incorporated consortia of domestic qualifying entities, are eligible to apply for funding as a prime recipient (lead organization) or subawardee (team member).

Each incorporated consortium must have an internal governance structure and a written set of internal rules. Upon request, the consortium must provide a written description of its internal governance structure and its internal rules to the DOE contracting officer.

#### UNINCORPORATED CONSORTIA

Unincorporated consortia (team arrangements), composed of qualifying domestic entities, must designate one member of the consortium to serve as the prime recipient/consortium representative (lead organization). The prime recipient/consortium representative must be incorporated (or otherwise formed) under the laws of a State or territory of the United States.

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

Management structure:

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

Note that a consortium is applied for in one application and results in one award with subawards to consortia members.

Collaborative applications, in which multiple institutions submit identical proposals to be reviewed as one proposal with separate awards to each proposing institution, will not be accepted.

#### DOE NATIONAL LABORATORIES, OTHER FEDERAL AGENCIES, AND THEIR FFRDCs

DOE National Laboratories, other Federal agencies, and their FFRDCs are invited to collaborate in the activities supported by this FOA, but they are neither eligible to receive financial assistance awards under this FOA nor are they eligible to submit independent applications under this FOA. Instead, DOE National Laboratories, other Federal agencies, and their FFRDCs must be proposed as subawardees in an application from an eligible prime applicant. DOE National Laboratories whose participation is considered for funding may be invited to submit a proposal in the Office of Science's PAMS website for the receipt of a Field Work Authorization. Other Federal agencies and their FFRDCs whose participation is considered for funding may be invited to submit a proposal in the Office of Science's PAMS website for the receipt of an Interagency Award.

#### **B. COST SHARING**

Cost sharing is not required.

#### **C. TRAINEESHIP PARTNERS**

Because the FOA requires DOE Traineeships programs include at least one of the following DOE-focused program elements below (for additional details, see FOA Section IV. Part C), at least one of the following requirements apply:

1. Partnership with a DOE National Laboratory
2. Partnership with a private sector for-profit or non-profit organization currently sponsored by DOE
3. Partnership with a non-DOE-sponsored public or private sector organization to address a workforce training need

In every situation, the application must include documentary evidence that the applicant has agreed to form a partnership to conduct the training and workforce development required by this FOA.

If the partnership is with a DOE National Laboratory, a DOE FFRDC, or another Federal agency's FFRDC, the partnership documentation must include an appropriate authorization:

Authorization for non-DOE/NNSA FFRDCs. The Federal agency sponsoring the FFRDC contractor must authorize in writing the use of the FFRDC contractor on the proposed project and this authorization must be submitted with the application. The use of a FFRDC contractor

must be consistent with the contractor's authority under its award and must not place the FFRDC contractor in direct competition with the private sector.

Authorization for DOE/NNSA FFRDCs. The cognizant Contracting Officer for the FFRDC must authorize in writing the use of a DOE/NNSA FFRDC contractor on the proposed project and this authorization must be submitted with the application. The following wording is acceptable for this authorization.

*"Authorization is granted for the [Name] Laboratory to participate in the proposed project. The work proposed for the laboratory is consistent with or complimentary to the missions of the laboratory, will not adversely impact execution of the DOE/NNSA assigned programs at the laboratory, and will not place the laboratory in direct competition with the domestic private sector."*

## **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 CFDA number (81.049) and/or the funding opportunity number (DE-FOA-0001782) shown on the cover of this FOA and then follow the prompts to download the application package.

Applications submitted through [www.FedConnect.net](http://www.FedConnect.net) will not be accepted.

### **B. LETTER OF INTENT AND PRE-APPLICATION**

#### **1. Letter of Intent**

A letter of intent is not required.

#### **2. Pre-application**

PRE-APPLICATION DUE DATE

[See Section IV, Part E.](#)

ENCOURAGE/DISCOURAGE DATE

[See Section IV, Part E.](#)

A pre-application is required and must/should be submitted by the date given in Section IV, Part E.

Pre-applications will be reviewed for responsiveness of the proposed work to the research topics identified in this FOA. DOE will send a response by email to each applicant encouraging or discouraging the submission of a full application by the date given in Section IV, Part E. Applicants who have not received a response regarding the status of their pre-application by this date are responsible for contacting the program to confirm this status.

**Only those applicants that receive notification from DOE encouraging a full application may submit full applications.** No other full applications will be considered.

The pre-application attachment should include, at the top of the first page, the following information:

Title of Pre-Application  
Principal Investigator Name, Job Title  
Institution  
List of collaborating institutions [if any]

The pre-application may not exceed two pages, including the title block above, with a minimum text font size of 11 point and margins no smaller than one inch on all sides. Figures and references, if included, must fit within the two-page limit.

The Pre-Application should contain clear and concise summaries of the information in the following sections:

**Definition of the Consortium** (required if this proposal is submitted by a consortium)

*If this proposal is submitted by a single university, omit this section and begin with the Background and Current Program section.*

Describe the overall consortium structure, including how all aspects of the program are shared and integrated across the consortium. Address the following points:

- What existing R&D programs in the targeted accelerator science and engineering areas are being leveraged to provide depth to the traineeship program? (N.B.: a traineeship program need not cover all four targeted areas described in Section I).
- What, specifically, is “shared”?
- Does the consortium structure require course credits to transfer between consortium partners? Is there a course credit sharing agreement in place?
- How does the consortium coordinate its interactions and collaborations with the required DOE-focused program elements (see Section I, Part B)?

**Background and Current Program**

Briefly describe the currently established graduate study programs in accelerator science, physics, and/or engineering. Briefly describe the current faculty and staff who will be engaged in the traineeship program, including their specific R&D, graduate teaching, and mentoring experience, as it directly relates to the targeted topic areas in accelerator science and engineering.

**Curriculum**

Describe the planned courses, curricula, seminars, workshops, tutorials, lab experience, mentored research experience, internships, and other activities that will be required of students in the traineeship program.

- Which courses are already offered?
- What new courses and materials need to be developed?

**Integration of the Traineeship Program with Existing R&D Efforts**

Describe the existing R&D efforts specifically in the targeted topic area(s) (see Section I) that will provide depth to the Traineeship program. This section should define where the R&D experience of the traineeship students will most often occur. It is very important that this section specifically define how the DOE-focused program elements will be incorporated (see Section I, Part B).

## **Program Process**

Briefly outline how the university or *consortium of universities* will:

- Advertise, recruit, and admit students.
- Evaluate progress and make decisions to fund students for a second year of the traineeship
- Assess and manage program performance
- Administer the program
- Track student outcomes

In developing responses to these points, please refer to the program objectives, principles, program requirements, and funding requirements described in Section I.

## **Expected Program Evolution**

Describe the expected evolution of the program over the 5-year course of the award.

- What preparation is needed?
- How many students are expected in the first and subsequent years?
- How does the curriculum evolve as the program enrollment increases?

The pre-application must also include a list of the names and institutional affiliations of all participating investigators, including collaborators and consultants on the proposed project.

Those pre-applications that are encouraged will be used to help the SC begin planning for the full application peer review process. The intent of the SC in discouraging submission of certain full applications is to save the time and effort of applicants in preparing and submitting full applications not responsive to this FOA.

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

It is important that the pre-application be a single file with extension .pdf, .docx, or .doc. The filename should not exceed 50 characters. The pre-application must be submitted electronically through the DOE SC PAMS website <https://pamspublic.science.energy.gov/>. The PI and anyone submitting on behalf of the PI must register for an account in PAMS before it will be possible to submit a pre-application. All PIs and those submitting pre-applications 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 Pre-Application:**

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

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

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, 9:00 AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, email: [sc.pams-helpdesk@science.doe.gov](mailto:sc.pams-helpdesk@science.doe.gov). All submission and inquiries about this FOA should reference **DE-FOA-0001782**.

Pre-applications submitted outside PAMS will not be considered. Pre-applications may not be submitted through grants.gov or www.FedConnect.net.

## **C. CONTENT AND APPLICATION FORMS**

### 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 the download software page at [https://www.grants.gov/help/download\\_software.jsp](https://www.grants.gov/help/download_software.jsp).

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.

### LETTERS

Letters of support are not required at the pre-application stage, but may be included in an application. See Section III, Part C.

### RENEWAL APPLICATIONS

Renewal applications will not be accepted.

### RESUBMISSION OF APPLICATIONS

Applications submitted under this FOA may be withdrawn from consideration by using the Office of Science's PAMS website at <https://pamspublic.science.energy.gov>. Applications may be withdrawn at any time between when the applicant submits the application and when DOE

makes the application available to merit reviewers. Such withdrawals take effect immediately and cannot be reversed.

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

Note that there may be a delay between the application's submission in Grants.gov and when it is available to be withdrawn in PAMS. The Office of Science will usually consider the last submission, according to its Grants.gov timestamp, to be the intended version. Please consult with your program manager to resolve any confusion about which version of an application should be considered.

#### IMPROPER CONTENTS OF APPLICATIONS

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

- Do not include information subject to any legal restriction on its open distribution, whether classified, export control, or unclassified controlled nuclear information.
- Do not include sensitive personally identifiable information, 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.
- Do not include letters of support from Federal officials.
- Do not include letters of support on Federal letterhead. Letters that are not letters of support (such as letters confirming access to sites, facilities, equipment, or data; or letters from cognizant contracting officers) may be on Federal letterhead.
- Clearly mark all proprietary or trade-secret information.

#### CHANGE OF AWARDEE INSTITUTION

If an awardee chooses to relinquish an award made under this FOA to permit the transfer of the award to a new institution, the new institution must submit an application under the then-available Office of Science "annual" or "open" FOA.

#### **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)

Only **new** applications will accepted for this FOA.

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.

PUBLIC POLICY REQUIREMENTS

The applicant assures DOE of its compliance with applicable public policy requirements, including the following:

Animal Welfare Act	7 USC 2131 et seq.,
Buy American Act	41 USC 10 et seq.
Cargo Preference Act	46 USC 55305, 46 CFR 381.7
Civil Rights Protections	10 CFR 1040
Debarment and Suspension	2 CFR 180, 2 CFR 901
Drug-Free Workplace Act	41 USC 701, 10 CFR 607
Environmental Protections	42 USC 7401, 33 USC 1251, 42 USC 4321
False Claims Act	31 USC 3729, 18 USC 287, 18 USC 1001, 10 CFR 1013
Federal Funding Accountability and Transparency Act	P.L. 109-282, 2 CFR 170
Fly America Act	49 USC 40118
Hatch Act	5 USC 1501 et seq.
Human Research Subjects Protections	10 CFR 745
Lobbying Disclosure Act	2 USC 1601 et seq.
Lobbying Prohibitions	31 USC 1352, 10 CFR 601
Metric System use	EO 12770
Non-delinquency on Federal Debt	28 USC 3201
Prohibition on benefitting Members of Congress	41 USC 6306
Seat Belt Use	EO 13043
Terrorist Financing	EO 13224, 66 FR 49079
Text Messaging While Driving	EO 13513, 74 FR 51225
Trafficking in Persons	22 USC 7104, 2 CFR 175

**2. Research and Related Other Project Information**

Complete questions 1 through 6 and attach files. 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 coinvestigators and their institutional affiliations, the objectives of the project, a description of the project, including methods to be employed, and the potential impact of the project (i.e., benefits, outcomes. A sample is provided below:

<p>A Really Great Idea</p> <p>A. Smith, Lead Institution (Principal Investigator) A. Brown, Institution 2 (Co-Investigator) A. Jones, Institution 3 (Co-Investigator)</p> <p>Text of abstract</p>
---

The project summary must not exceed one page when printed using standard 8.5" by 11" paper with 1" 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 may to prepare public reports about supported research.

DOE COVER PAGE

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

The application narrative should 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:
- Street Address/City/State/Zip:
- Postal Address:
- Lead PI name, telephone number, email:
- Administrative Point of Contact name, telephone number, email:
- Funding Opportunity FOA Number: DE-FOA-0001782
- DOE/Office of Science Program Office: High Energy Physics
- DOE/Office of Science Program Office Technical Contact: Dr. Eric Colby
- DOE Award Number (if Renewal Application):
- PAMS Preproposal tracking number (if applicable):

**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.

#### PROJECT NARRATIVE (FIELD 8 ON THE FORM)

The project narrative **must not exceed 15 pages** of technical information, 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. Merit reviewers will only consider the number of pages specified in the first sentence of this paragraph. This page limit does not apply to the Cover Page, Budget Page(s), Budget Justification, biographical material, publications and references, and appendices, each of which may have its own page limit.

Do not include any Internet addresses (URLs) that provide supplementary or additional information that constitutes a part of the application. Merit reviewers are not required to access Internet sites; however, Internet publications in a list of references will be treated identically to print publications. See Section VIII., Part D for instructions on how to mark proprietary application information. To attach a Project Narrative, click “Add Attachment.”

The program description should clearly and completely address the requirements in Section I of the FOA, and each of the Merit Review Criteria listed in Section V, Part 2 of this FOA. The program description must contain the following sections:

#### **Definition of the Consortium** (required if this proposal is submitted by a consortium)

*If this proposal is submitted by a single university, omit this section and begin with the Background and Current Program section.*

Describe the overall consortium structure, including how all aspects of the program are shared and integrated across the consortium. Address the following points:

- What existing R&D programs in the targeted accelerator science and engineering areas are being leveraged to provide depth to the traineeship program? (N.B.: a traineeship program need not cover all four targeted areas described in Section I)
- What, specifically, is “shared”? Which university hosts which aspects of the training program? How and when will students at the participating universities be brought together to share experiences?
- If the consortium structure requires course credits to transfer between consortium partners, attach documentation of course credit transfer agreements in Appendix 7. If no such course credit transfer agreements exist, describe the process and plans to put such agreements in place.

- How are traineeships awarded in a balanced manner across the multiple participating universities? How specifically does the lead university work with its consortium partners to ensure:
  - Broad awareness of the opportunity
  - Fair allocation of traineeship awards
  - Proactive efforts to increase diversity and inclusion
  - How does the consortium coordinate its interactions and collaborations with the required DOE-focused program elements (see Section I, Part B)?

## **Background and Current Program**

This section should describe the currently established graduate study programs in accelerator science, physics, and/or engineering. Please provide a brief history of the academic program, discuss the current program, and describe the future plans for the program. Provide evidence of the University's commitment to the growth and maintenance of the academic program. Describe the number of students graduated, and statistics describing their career placements after graduation (where known).

Provide an overview of the current faculty and staff who will be engaged in the traineeship program, including their specific R&D, graduate teaching, and mentoring experience, as it directly relates to the targeted topic areas in accelerator science and engineering.

If the traineeship is being proposed by a consortium of universities, provide descriptions (per the instructions above) for each participating institution and its personnel.

## **Proposed DOE Traineeship Program**

The remaining sections of the narrative should define the DOE Traineeship program.

### ***Curriculum***

Describe the planned courses, curricula, seminars, workshops, tutorials, lab experience, mentored research experience, internships, and other activities that will be required of students in the traineeship program.

- Which courses are already offered?
- What new courses and materials need to be developed?
- What “non-traditional” training will the traineeship program provide to better prepare students for a career at a DOE National Laboratory? (e.g.: project management, oral and written science communication, developing and working within large collaborations (team science), and entrepreneurial skills, etc.). How will this training be accomplished?

### ***Integration of the Traineeship Program with Existing R&D Efforts***

An R&D experience is critical to effective training in accelerator science and engineering. This section should describe the existing R&D efforts specifically in the targeted topic area(s) (see Section I) that will provide depth to the Traineeship program. This section should define where the R&D experience of the traineeship students will most often occur. It is very important that this section specifically define how the DOE-focused program elements will be incorporated (see Section I, Part B).

- Which aspects of the R&D experience are provided by the university (or universities, if this is a consortium)?
- What aspects are provided by a national laboratory?
- How, specifically, will this traineeship program work to prepare well-trained scientists and engineers that can easily integrate into DOE National Laboratory programs?

### ***Program Process***

Describe how the university or *consortium of universities* will:

- Advertise the training opportunity
- Recruit students to achieve the required enrollment of 5-10 new students per year
- Assess and manage balance (*institutional, topical, diversity, inclusivity*)
- Determine eligibility and admit students to the traineeship program
- Evaluate progress and make decisions to fund students for a second year of the traineeship
- *Disburse funds from the lead university to consortium partners*
- Specifically allocate the traineeship funding (see Section I, Part C)
  - *For each university, if this is a consortium proposal*
- Assess and manage program performance
  - What metrics will the program use to assess effectiveness at achieving the objectives (see section I)
- Evolve the program in later years to better achieve the objectives
- Administer the program
- Track student outcomes (first career placement, first permanent career placement)

In developing responses to these points, please refer to the program objectives, principles, program requirements, and funding requirements described in Section I.

### ***Expected Program Evolution***

Describe the expected evolution of the program over the course of the award.

- What advance preparations are needed? (e.g. course preparation, course credit transfer agreements, etc.)
- How many students are expected in the first and subsequent years?
- How does the curriculum evolve as the program enrollment increases?
- How does the consortium structure and partnerships with DOE partners evolve as enrollment increases?
- What is the probable steady-state configuration of this program?

## ***Conclusion***

Conclude the narrative with a specific description of how the proposed traineeship program will meet DOE's workforce development objectives in accelerator science and engineering (see Section I).

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

## APPENDIX 1: BIOGRAPHICAL SKETCH

Provide a biographical sketch for the 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.
- The biographical information (curriculum vitae) for each person 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 and must include:

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

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

**Publications:** Provide a list of up to 10 publications most closely related to the proposed project. For each publication, identify the names of all authors (in the same sequence in which they appear in the publication), the article title, book or journal title, volume number, page numbers, year of publication, and website address if available electronically. Patents, copyrights and software systems developed may be provided in addition to or substituted for publications.

**Synergistic Activities:** List no more than five 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.

**Personally Identifiable Information:** Do not include sensitive personally identifiable information such as a Social Security Number, date of birth, or city of birth. Do not include information that a merit reviewer should not make use of.

#### APPENDIX 2: 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 persons, 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 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

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 3: BIBLIOGRAPHY & REFERENCES CITED

Provide a bibliography of any references cited in the Project Narrative. Each reference must include the names of all authors (in the same sequence in which they appear in the publication),

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

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

#### APPENDIX 4: FACILITIES & OTHER RESOURCES

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

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

#### APPENDIX 5: EQUIPMENT

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

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

#### APPENDIX 6: DATA MANAGEMENT PLAN

Provide a Data Management Plan (DMP) 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 example, cost/benefit considerations, other parameters of feasibility, scientific appropriateness, or limitations discussed in #4). At a minimum, DMPs must describe how data sharing and preservation will enable validation of results, or how results could be validated if data are not shared or preserved.

2. DMPs should provide a plan for making all research data displayed in publications resulting from the proposed research open, machine-readable, and digitally accessible to the public at the time of publication. This includes data that are displayed in charts, figures, images, etc. In addition, the underlying digital research data used to generate the displayed data should be made as accessible as possible to the public in accordance with the principles stated in the Office of Science Statement on Digital Data Management (<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 SC 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 SC facilities can be found in the additional guidance from the sponsoring program.
4. DMPs must protect confidentiality, personal privacy, Personally Identifiable Information, and U.S. national, homeland, and economic security; recognize proprietary interests, business confidential information, and intellectual property rights; avoid significant negative impact on innovation, and U.S. competitiveness; and otherwise be consistent with all applicable laws, and regulations. There is no requirement to share proprietary data.

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

- This appendix should not exceed two pages 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)
- Do not attach a separate file.
- This appendix will not count in the project narrative page limitation.

Note: A DMP is required to describe how any data resulting from research supported by this application will be managed. If no data will be generated, or if all research will be conducted under provisions of other DMPs, the DMP contained in this application may be brief.

#### APPENDIX 7: 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, but do not use this appendix to circumvent the page limitations of the application. Reviewers are not

required to consider information in this appendix.

- Do not attach a separate file.
- This appendix will not count in the project narrative page limitation.
- **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.**
- **Do not attach any files to fields 9, 10, 11, or 12.**

### 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 V, Part 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 allocated to the project, requested salary fringe benefits, and the total funds requested for each person. The requested salary must be the product of the base salary and the effort. Include a written narrative in the budget justification that justifies the need for requested personnel.
Section B Other Personnel	List personnel, the number of months that person will be allocated to the project, requested salary fringe benefits, and the total funds requested for each person. Include a written narrative in the budget justification that fully justifies the need for requested personnel.
Section C Equipment	For the purpose of this budget, equipment is designated as an item of property that has an acquisition cost of \$5,000 or more and an expected service life of more than one year. (Note that this designation applies for proposal budgeting only and differs from the DOE definition of capital equipment.) List <b>each</b> item of equipment separately and justify each in the budget justification section. Do not aggregate items of equipment. Allowable items ordinarily will be limited to research equipment and apparatus not already available for the conduct of the work. General-purpose office equipment is not eligible for support

	unless primarily or exclusively used in the actual conduct of scientific research.
Section D Travel	For purposes of this section only, travel to Canada or to Mexico is considered domestic travel. In the budget justification, list each trip's destination, dates, estimated costs including transportation and subsistence, number of staff traveling, the purpose of the travel, and how it relates to the project. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). To qualify for support, attendance at meetings or conferences must enhance the investigator's capability to perform the research, plan extensions of it, or disseminate its results. Domestic travel is to be justified separately from foreign travel.
Section E Participant/Trainee Support Costs	If applicable, submit training support costs. Educational projects that intend to support trainees (precollege, college, graduate and post graduate) must list each trainee cost that includes stipend levels and amounts, cost of tuition for each trainee, cost of any travel (provide the same information as needed under the regular travel category), and costs for any related training expenses. Participant costs are those costs associated with conferences, workshops, symposia or institutes and breakout items should indicate the number of participants, cost for each participant, purpose of the conference, dates and places of meetings and any related administrative expenses. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis).
Section F Other Direct Costs	<ul style="list-style-type: none"> <li>• <b>Materials and Supplies:</b> Enter total funds requested for materials and supplies in the appropriate fields. In the budget justification, indicate general categories such as glassware, and chemicals, including an amount for each category (items not identified under "Equipment"). Categories less than \$1,000 are not required to be itemized. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis).</li> <li>• <b>Publication Costs:</b> 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).</li> <li>• <b>Consultant Services:</b> 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).</li> </ul>

	<ul style="list-style-type: none"> <li>• <b>ADP/Computer Services:</b> 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).</li> <li>• <b>Subawards/Consortium/Contractual Costs:</b> Enter total costs for all subawards/consortium organizations and other contractual costs proposed for the project. In the budget justification, justify the details.</li> <li>• <b>Equipment or Facility Rental/User Fees:</b> 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).</li> <li>• <b>Alterations and Renovations:</b> 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.</li> <li>• <b>Other:</b> Add text to describe any other Direct Costs not requested above. Enter costs associated with “Other” item(s). Use the budget justification to further itemize and justify.</li> </ul>
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, so please consolidate if needed. 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

The proposed budget must adhere to the following guidelines:

- The overall funding per award should be limited to no more than \$1 million per year.
- Generally, proposal budgets should provide for program support that is equivalent to no more than \$55,000 per student per year. Funding should provide for monthly stipends, supplemental support for university tuition and fees, travel related to the scope of the training program, and other training related expenses. The \$55,000 per student per year assumes 12-month student participation, a \$30,000 - \$35,000 stipend per year, and no more than \$2,000 - \$3,000 for traineeship-related travel per student per year. The remainder should provide for associated costs to carry out the scope of the training program, including partnership costs, limited equipment, program evaluation efforts, and/or supplemental support for tuition and fees for the student.

- Awards should support three to six new students per year, with a total of six to twelve students supported each year after the first year.
- The university should expect to share any additional tuition or fee costs required by the graduate student and cost of staff time.

Generally, DOE Traineeship awards will not support institutional personnel salaries. A limited amount of funding in the overall budget may be used for staff time under circumstances where research or technical staff is developing new training related curriculum, workshops, or courses. Allowable costs must comply with the cost principles of 2 CFR 200 as modified by 2 CFR 910.

#### 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.

#### 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. Summary of Required Forms/Files

Your application must include the following items:

<b>Name of Document</b>	<b>Format</b>	<b>Attach to</b>
<b>SF 424 (R&amp;R)</b>	Form	N/A
<b>RESEARCH AND RELATED Other Project Information</b>	Form	N/A
Project Summary/Abstract	PDF	Field 7
Project Narrative, including required appendices	PDF	Field 8
<b>RESEARCH &amp; RELATED BUDGET</b>	Form	N/A
Budget Justification	PDF	Field K
<b>PROJECT/PERFORMANCE SITE LOCATION(S)</b>	Form	N/A
<b>SF-LLL Disclosure of Lobbying Activities, if applicable</b>	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
- Environmental Information

## E. SUBMISSION DATES AND TIMES

### 1. Letter of Intent Due Date

No Letter of Intent is required.

### 2. Pre-application Due Date

June 23, 2017 at 5:00pm Eastern Time.

You are encouraged to submit your pre-application well before the deadline.

### **3. Application Due Date**

July 31, 2017 at 5:00pm Eastern Time.

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

### **4. Late Submissions**

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.
- An upper respiratory infection (a “cold”) the week of the deadline.

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

Applicants must contact the DOE Program Office/Manager listed in this FOA to discuss the option of a late submission. Contacting the DOE 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.

## **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 prior approval from the DOE 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](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.
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Applicants must register with FedConnect at [www.fedconnect.net](http://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.fdrs.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](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](mailto: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](http://www.grants.gov). (See <https://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).

## 3. Application Receipt Notices

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).

#### **4. 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, Part A of this FOA.)

Submit electronic applications through the “Apply for Grants” function at [www.grants.gov](http://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](mailto: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.

#### **5. DOE Office of Science (SC) Portfolio Analysis and Management System (PAMS)**

After you submit your application through grants.gov, the application will automatically transfer into the PAMS for processing by the DOE SC. 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](mailto: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](mailto:sc.pams-helpdesk@science.doe.gov). All submission and inquiries about this Funding Opportunity Announcement should reference DE-FOA-0001782.

## **6. Viewing Submitted Applications**

Each Grants.gov application submitted to the DOE 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 0000xxxxxx 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 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](mailto:sc.pams-helpdesk@science.doe.gov). All submission and inquiries about this Funding Opportunity Announcement should reference **DE-FOA-0001782**.

## **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.

Applications submitted without a pre-application having been previously submitted by the pre-application deadline will be declined without review. While applications may be submitted against a “discourage” recommendation, the intent of such a recommendation is to spare the PI, the proposing team (and the reviewers) from writing (and reviewing) a proposal that is not aligned with the goals of the FOA, and therefore unlikely to be awarded funding.

Applications submitted after the deadline stated in Section IV, Part E will be declined without review.

#### **2. Merit Review Criteria**

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

- 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.

The evaluation process will include program policy factors such as the relevance of the proposed research to the terms of the FOA and the agency’s programmatic needs. 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.

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

## GENERAL INSTRUCTIONS TO REVIEWERS

Applications to the DOE Traineeship in Accelerator Science and Engineering must specifically address one of four subjects:

1. Physics of large accelerators and systems engineering
2. Superconducting radiofrequency accelerator physics and engineering
3. Radiofrequency power system engineering
4. Cryogenic systems engineering (especially liquid helium systems)

Awards will provide student support for a university or consortium of universities to train 5-10 graduate students per year in one or more of these targeted areas.

### SCIENTIFIC AND/OR TECHNICAL MERIT OF THE PROPOSED TRAINEESHIP PROGRAM

- What is the potential of the program to conduct graduate STEM education in accelerator science and engineering?
- Is the traineeship program well aligned with the four targeted DOE-supported workforce needs in accelerator science and engineering?
- Are the scope and depth of the classes, and plans for the graduate STEM program appropriate?
- How innovative is the proposed traineeship program, and what is its potential to increase graduate student enrollment and graduation in the targeted areas of accelerator science and engineering?

### APPROPRIATENESS OF THE PROPOSED METHOD OR APPROACH

- Is the university's proposed method and approach appropriate?
- If the applicant is a consortium of universities, is the plan to share students, courses, course credit, instructors, lab facilities, and resources across the participating institutions clearly defined, and likely to be effective? Why or why not?
- Are advertising and outreach plans to help students learn about the traineeship opportunity well developed and likely to be effective?
- Has the applicant provided a plan to enhance diversity and inclusion in accelerator science and engineering? Is the plan clear, and likely to be effective?
- Is the process to distribute, track, and report fellowship/scholarship funds clearly defined?
- Has the applicant provided a clear Performance Evaluation Plan (PEP) to measure the efficacy of the traineeship program? Will the PEP be effective at measuring and improving the performance of the traineeship program?

### COMPETENCY OF APPLICANT'S PERSONNEL AND ADEQUACY OF PROPOSED RESOURCES

- Are the qualifications, experience, and resources of the applicant adequate to accomplish the traineeship program?
- Are the R&D programs (which are not funded by the Traineeship program) in the targeted

accelerator science and engineering topics of sufficient quality to provide a high-quality graduate training experience for the students? If the hosting university (or universities, if this is a consortium) lack an adequate R&D program in the specific topic areas, is the plan to collaborate with a National Laboratory clearly defined, and is it likely to provide a high quality training experience for the students?

#### REASONABLENESS AND APPROPRIATENESS OF THE PROPOSED BUDGET

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

### **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 codified at 10 CFR 605.10(d) in accordance with the guidance provided in the “Office of Science Merit Review System for Financial Assistance,” which is available at: <http://science.energy.gov/grants/policy-and-guidance/merit-review-system/>.

#### **2. Program Policy Factors**

The DOE selection official may consider the following program policy factors in the selection process:

- Institutional diversity and consideration of institutions underrepresented in the HEP university program portfolio, including minority serving institutions. It may be desirable that different kinds and sizes of universities be selected for award in order to provide a balanced programmatic effort and a variety of different traineeship perspectives;
- Geographic distribution. It may be desirable to select for award a university or universities representing or serving a broad or specific geographic distribution of the population.
- The degree to which the proposed project, including any proposed institutional commitments, optimizes the use of available funding to achieve programmatic objectives.

#### **3. Selection**

The Selection Officials will consider the following items, listed in no order of significance:

- Merit and likely efficacy of the proposed traineeship program, as determined by merit review
- Availability of funds
- Institutional diversity and consideration of institutions underrepresented in the DOE Office of High Energy Physics university program portfolio.
- Diversity of geographic distribution of awarded institutions.
- The degree to which the proposed project, including proposed institutional commitments, optimizes the use of available funding to achieve programmatic objectives.
- Relevance of the proposed activity to SC priorities

- Ensuring an appropriate balance of activities within SC programs
- Previous performance

#### **4. Review of Risk**

Pursuant to 2 CFR 200.205, DOE will conduct an additional review of the risk posed by applications submitted under this FOA. Such review of risk will 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 interested in seeing DOE traineeships commence no later than the start of the 2018-2019 academic year.

## **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, Part G with respect to the allowability of pre-award costs.)

**Non-selected Notification:** Organizations whose applications have not been selected will be advised as soon 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 Summary; and (7) Federal Assistance Reporting Checklist, which identifies the reporting requirements.

For grants and cooperative agreements made to universities, non-profits and other entities subject to Title 2 CFR, awards made under this funding opportunity should include the government-wide Research Terms and Conditions. A new version of the Terms and Conditions based on the changes to 2 CFR 200 is not yet available. Once the Terms and Conditions become available, they will be located at <http://www.nsf.gov/bfa/dias/policy/rct/index.jsp>. If an award is made under this funding opportunity before the Terms and Conditions are posted, alternative Terms and Conditions may be included in the award.

### **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/rct/rctoverlay\\_march17.pdf](https://www.nsf.gov/pubs/policydocs/rct/rctoverlay_march17.pdf) and the DOE Agency Specific Standard Research Terms and Conditions published at [https://www.nsf.gov/pubs/policydocs/rct/agencyspecifics/doe\\_417.pdf](https://www.nsf.gov/pubs/policydocs/rct/agencyspecifics/doe_417.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. Statement of Substantial Involvement**

A cooperative agreement may be awarded under this FOA. If the award is a cooperative agreement, the DOE Contract Specialist and DOE Program Manager will negotiate a Statement of Substantial Involvement prior to award.

## **5. 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, 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](mailto:support@grants.gov). DOE cannot answer these questions.

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

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, 9:00 AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, Email: [sc.pams-helpdesk@science.doe.gov](mailto:sc.pams-helpdesk@science.doe.gov). All submission and inquiries about this FOA should reference **DE-FOA-0001782**.

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

Questions regarding the specific program areas and technical requirements may be directed to the technical contacts listed for each program within the FOA or below. Please contact the program staff with all questions not directly related to the grants.gov or PAMS systems.

### B. AGENCY CONTACTS

Grants.gov Customer Support	800-518-4726 (toll-free) <a href="mailto:support@grants.gov">support@grants.gov</a>
PAMS Customer Support	855-818-1846 (toll-free) 301-903-9610 <a href="mailto:sc.pams-helpdesk@science.doe.gov">sc.pams-helpdesk@science.doe.gov</a>
Program Manager Scientific Contact	Dr. Eric R. Colby (301)-903-5475 <a href="mailto:Eric.Colby@science.doe.gov">Eric.Colby@science.doe.gov</a>

## **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 conflict of interest 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. 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**

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.

## **K. NATIONAL ENVIRONMENTAL POLICY ACT COMPLIANCE**

If the disclosure 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 or an environmental assessment, which may occur post-award. If DOE determines it is necessary, this latter process would need to be completed, both funded by and with the participation of the awardee, prior to them taking any action on the proposed project that could have adverse environmental effect or that could limit the choice of reasonable alternatives. The inability to satisfy the NEPA requirements after an award would result in cancellation of any said award.

## Section IX - APPENDICES/REFERENCE MATERIAL

### Glossary of Useful Grants and Cooperative Agreement terms

<b>acquisition cost</b>	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.
<b>administrative requirements</b>	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.
<b>allocation</b>	The process of assigning costs to one or more cost objectives, in reasonable and realistic proportion to the benefit provided or other equitable relationship.
<b>allocability</b>	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.
<b>allowable cost</b>	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).
<b>application</b>	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
<b>Appropriation Act</b>	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.
<b>approved budget</b>	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.
<b>assurance</b>	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.
<b>authorized organizational representative award</b>	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.
<b>award documents</b>	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.

<b>Bayh-Dole Act</b>	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
<b>budget</b>	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.
<b>budget period</b>	The intervals of time (usually 12 months each) into which a project period is divided for budgetary and funding purposes.
<b>business officer</b>	The financial official of the grantee who has primary fiscal responsibility for the grant. Also known as authorized organizational representative.
<b>carryover</b>	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.
<b>change in scope</b>	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.
<b>closeout</b>	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.
<b>competitive segment</b>	The initial project period recommended for support or each extension of a project period resulting from a renewal award.
<b>conference (domestic or international)</b>	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.
<b>consortium or subaward agreement</b>	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.
<b>consultant</b>	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.
<b>continuation application/award</b>	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.
<b>contract</b>	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.
<b>Contract (or Grants Management) Officer</b>	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.
<b>Contract (or Grants Management) Specialist</b>	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.
<b>cooperative agreement</b>	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.
<b>cost principles</b>	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. As of December 26, 2014, the cost principles will be consolidated in 2 CFR 200.
<b>cost sharing</b>	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.
<b>deadline</b>	The published date and/or time that a grant application is to be either postmarked/mailed or electronically submitted to the funding agency.
<b>debarment and suspension</b>	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.
<b>direct costs</b>	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.
<b>disallowance</b>	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.
<b>domestic organization</b>	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.
<b>DUNS number</b>	A nine-digit number established and assigned by Dun and Bradstreet to uniquely identify a business entity.
<b>effort</b>	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.
<b>equipment</b>	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.
<b>expanded authorities</b>	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 preaward 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.
<b>expiration date</b>	Generally, the date signifying the end of the current project period, after which the grantee is not authorized to obligate grant funds.
<b>facilities and administrative costs</b>	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.
<b>Federal Financial Report</b>	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)
<b>financial assistance</b>	Transfer by DOE of money or property to an eligible entity to support or stimulate a public purpose authorized by statute.
<b>Financial Status Report</b>	See Federal Financial Report.
<b>foreign travel</b>	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.
<b>funding opportunity announcement</b>	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 <a href="https://www.grants.gov/FIND">Grants.gov/FIND</a> . An FOA may also be known as a solicitation.
<b>grant</b>	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.
<b>grant-supported project or activity</b>	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.
<b>grantee</b>	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.

<b>Grants.gov</b>	Grants.gov ( <a href="http://www.grants.gov/">http://www.grants.gov/</a> ) 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.
<b>indirect costs</b>	See facilities and administrative costs definition.
<b>institutional base salary</b>	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.
<b>matching or cost sharing</b>	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.
<b>merit (or peer) review</b>	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.
<b>monitoring</b>	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.
<b>no-cost extension</b>	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.
<b>non-Federal share</b>	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.
<b>obligations</b>	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.
<b>OMB Circulars</b>	Government-wide guidance issued to Heads of Federal agencies by the Director of OMB. OMB Circulars directly pertinent to grants include the following: <ul style="list-style-type: none"><li>• cost principles (OMB Circular A-21, OMB Circular A-87, and OMB Circular A-122);</li><li>• uniform administrative requirements (OMB Circular A-102 and OMB Circular A-110);</li><li>• audit requirements for non-profit organizations (OMB Circular A-133).</li></ul> Some (but not all) of these OMB Circulars have been reissued in Title 2 of the Code of Federal Regulations. DOE administrative regulations are located in Title 10 of the Code of Federal Regulations.
<b>Other Significant Contributors</b>	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.

<b>participant</b>	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.
<b>participant costs</b>	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.
<b>person months</b>	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.
<b>pre-application or pre-proposal</b>	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: <ul style="list-style-type: none"> <li>• 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.</li> <li>• Increase the overall quality of the full submission.</li> <li>• Distill the number of applications that will be submitted to the agency and the number of anticipated reviewers needed to review.</li> </ul>
<b>pre-award costs</b>	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.
<b>prior approval</b>	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
<b>Program Director/ Principal Investigator</b>	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.
<b>program income</b>	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.
<b>Program Manager</b>	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.

<b>progress report</b>	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.
<b>project/performance site</b>	Location(s) of where the work described in the research plan will be conducted.
<b>project period</b>	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.
<b>proposal re-budgeting</b>	See application. Reallocation of funds available for spending between budget categories to allow best use of funds to accomplish the project goals.
<b>recipient renewal application</b>	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.
<b>research</b>	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.”
<b>research misconduct</b>	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.
<b>SAM.gov</b>	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).
<b>scope of work</b>	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.
<b>Senior/Key Personnel</b>	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.
<b>significant rebudgeting</b>	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.
<b>small business concern</b>	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.

<b>solicitation</b>	See Funding Opportunity Announcement
<b>subaward</b>	A legal instrument by which a recipient provides funds (or property in lieu of funds) to an eligible subrecipient (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.
<b>subrecipient</b>	A party that receives a subaward from a recipient or another subrecipient under a Federal financial assistance award and is accountable to the recipient or subrecipient for the use of the Federal funds provided by the subaward.
<b>supplement</b>	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.
<b>terms and conditions of award</b>	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 protect the Federal government's interests.
<b>unallowable costs</b>	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.
<b>unliquidated obligation</b>	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.
<b>unobligated balance</b>	The portion of the funds authorized by the Federal agency for expenditure by the recipient that has not been obligated by the recipient.
<b>Validate</b>	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.