FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT

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

FY2015 Research Opportunities in Accelerator Stewardship

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Encourage/Discourage Response:	**July 10, 2014, at 5 PM Eastern Time**
Application Due Date:	**September 4, 2014, at 11:59 PM Eastern Time**

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REGISTRATIONS

A. Systems to Register In

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

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

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

Applicants must register with FedConnect at www.fedconnect.net. If an award is made, the full and binding version of the assistance agreement between your institution and the U.S. Department of Energy (DOE) will be posted to FedConnect.

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

B. Registering in Grants.gov

Applicants must register with Grants.gov. There are three steps to this process.

1. The Authorized Organizational Representative (AOR) must register at: https://apply07.grants.gov/apply/OrcRegister
2. An email is sent to the E-Business (E-Biz) POC listed in SAM. The E-Biz POC must approve the AOR registration using their "Marketing Partner Identification Number" (MPIN) from their SAM registration.
3. AOR verifies that registration was completed at: http://grants.gov/applicants/applicant_profile.jsp.

More information about the above steps is provided at: http://www.grants.gov/applicants/organization_registration.jsp.

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**.

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).

Applicants must download the application package, application forms and instructions, from Grants.gov at http://www.grants.gov/
(Additional instructions are provided in Section IV A of this FOA.)

Applications must be submitted through Grants.gov to be considered for award. You cannot submit an application through Grants.gov unless you are registered. Please read the registration requirements carefully and start the process immediately. Remember you have to update your SAM registration annually. If you have any questions about your registration, you should contact the Grants.gov Helpdesk at 1-800-518-4726 to verify that you are still registered in Grants.gov.

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

The DOE Office of Science (SC) performs many functions for grants and cooperative agreements in the Portfolio Analysis and Management System (PAMS), which is available at https://pamspublic.science.energy.gov.

There are many activities that you can perform in PAMS, and more functionality will be added throughout the near future. Most significantly, you can "register to" your application: you can link yourself to the application after it has been submitted through grants.gov. You will submit pre-applications and Letters of Intent through PAMS.

You must register in PAMS to submit a pre-application or a Letter of Intent.

To access PAMS, you may use the Internet Explorer, Firefox, Google Chrome, or Safari browsers.

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

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

1. CREATE PAMS ACCOUNT:

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

- Click the "No, I have never had an account" link and then the "Create Account" button.
- You will be prompted to enter your name and email address, create a username and password, and select a security question and answer. Once you have done this, click the "Save and Continue" button.
- On the next page, enter the required information (at least one phone number and your mailing address) and any optional information you wish to provide (e.g., FAX number, website, mailstop code, additional email addresses or phone numbers, Division/Department). Click the "Create Account" button.

- Read the user agreement and click the "Accept" button to indicate that you understand your responsibilities and agree to comply with the rules of behavior for PAMS.
- PAMS will take you the "Having Trouble Logging In?" 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. (Hint: If your institution has an acronym, such as UCLA for the Regents of the University of California, Los Angeles, you may search for the acronym under "Institution Name like." Many institutions with acronyms are listed in PAMS with their acronyms in parentheses after their names.)
- Find your institution in the list that is returned by the search and click the "Actions" link in the Options column next to the institution name to obtain a dropdown list. Select "Add me to this institution" from the dropdown. PAMS will take you to the "Institutions – List" page.
- If you do not see your institution in the initial search results, you can search again by clicking the "Cancel" button, clicking the Option 2 link, and repeating the search.
- If, after searching, you think your institution is not currently in the database, click the "Cannot Find My Institution" button and enter the requested institution information into PAMS. Click the "Create Institution" button. PAMS will add the institution to the system, associate your profile with the new institution, and return you to the "Institutions – List" page when you are finished.

For help with PAMS, click the "External User Guide" link on the PAMS website, https://pamspublic.science.energy.gov/. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, Email: sc.pams-helpdesk@science.doe.gov. All submission to and inquiries about this Funding Opportunity Announcement (FOA) should reference **DE-FOA-0001142.**

RECOMMENDATION

The Office of Science encourages you to register in all systems as soon as possible. You are also encouraged to submit letters of intent and applications well before the deadlines.

Section I – FUNDING OPPORTUNITY DESCRIPTION

GENERAL INQUIRIES ABOUT THIS FOA SHOULD BE DIRECTED TO:

Administrative Contact:

Questions about program rules should be sent to SC.HEPFOA@science.doe.gov

Technical/Scientific Program Contact:

Questions regarding the specific program areas/technical requirements should be directed to the technical contacts listed below for each program covered by the FOA.

STATUTORY AUTHORITY

Public Law 95-91, US Department of Energy Organization Act
Public Law 109-58, Energy Policy Act of 2005

APPLICABLE REGULATIONS

U.S. Department of Energy Financial Assistance Rules, codified at 10 CFR 600
U.S. Department of Energy, Office of Science Financial Assistance Program Rule, codified at 10 CFR 605

SUMMARY

The Office of High Energy Physics at the U.S. Department of Energy, Office of Science hereby invites new grant applications for support of research programs in Accelerator R&D Stewardship.

SUPPLEMENTARY INFORMATION

The following program description is offered to provide more in-depth information on scientific and technical areas of interest to the Office of High Energy Physics Long-Term Accelerator R&D Stewardship program.

Please note that this Funding Opportunity Announcement is only for opportunities advancing the Accelerator R&D Stewardship mission, and that there is a separate Funding Opportunity Announcement for research and development within the objectives of the High Energy Physics program. Proposals for R&D activities that predominantly impact the High Energy Physics mission should be submitted to the HEP Comparative Review FOA, **DE-FOA-0001140**. This Accelerator Stewardship FOA is for R&D activities that may impact High Energy Physics, but which predominantly impact other non-HEP applications.

Program Website: http://science.energy.gov/hep/research/accelerator-rd-stewardship/

The mission of the long-term accelerator R&D stewardship program is to support fundamental accelerator science and technology development of relevance to many fields beyond High Energy Physics, and to disseminate accelerator knowledge and training to the broad community of accelerator users and providers.

Central goals of Accelerator R&D Stewardship are to:

- Engage the expertise and facilities of the existing U. S. accelerator R&D ecosystem in a manner that enhances the ability of the DOE Office of Science specifically, and other federal agencies generally, to conduct their missions;
- Enhance the accelerator technology capabilities of U. S. industry;
- Drive a limited number of specific accelerator applications towards practical, testable prototypes in a 5-7 year timeframe;
- Foster collaboration between developers of accelerator technology and experts who apply accelerator technology;
- Provide the basic R&D foundation necessary for sustained innovation across a broad range of accelerator applications.

This call for grant applications is focused on two distinct activities: (1) applied R&D that is focused on developing a prototype in response to a specific technical challenge, and (2) basic research that broadly impacts many accelerator applications. These activities are divided into two separate "Tracks" in this Funding Opportunity Announcement. Proposals must address a topic in one Track **only**, topics may not be combined between Tracks as the proposal format, eligibility requirements, and merit criteria differ significantly.

Applications that are intended to meet specific BES or NP programmatic needs should be submitted in response to the FOAs issued by those Offices.

Applications that are not in direct support of a topic under the Tracks below (e.g., conferences, experimental operations, specific project R&D or fabrication, etc.) must be submitted to the current annual Office of Science Funding Opportunity Announcement (DE-FOA-0000995 for Fiscal Year 2014).

Track 1: Accelerator Stewardship Topical Areas
Technical Contact: is specific to the topic; see below.

Accelerator Stewardship Topic Areas are focused R&D efforts aimed at solving a specific accelerator application problem in a specific area. The desired end goal after 1-2 grant cycles (3-6 years) is a working prototype technology. This Track has broad eligibility requirements, see section III.A for more information. Teams, comprising at a minimum an accelerator technology partner and an application partner, are expected to apply in this area, and develop a proposal that clearly defines the technology development pathway, teaming and management plan, IP allocation, and market opportunity (where applicable).

Applicants must provide a demonstration of the Stewardship customer's commitment to the proposed activity. This commitment may take the form of uncompensated effort; the provision of

surplus materials, supplies, or equipment; the provision of access to facilities at no or reduced cost; voluntary cost sharing; mentoring, training, or coaching of personnel; or other methods of involving the Stewardship customer in the proposed activity.

There are three topic areas active in Track 1 of this FOA:

a) Particle Therapy Beam Delivery Improvements
b) Ultrafast Laser Technology Program
c) Energy Efficiency Improvements for Office of Science Accelerators

Grant applications submitted under Track 1 should address specific research goals in only **one** of these topical areas.

In addition to the standard merit criteria applied to all scientific grant applications, grant applications submitted under Track 1 will be specifically reviewed for (1) the strength and breadth of the collaborative team and (2) the quality of the technology R&D plan. See section V.A.2 for a description of the Merit Review Criteria.

Grant applications may **not** apply to both Track 1 and Track 2 simultaneously, as the work profile, eligibility requirements, and proposal formats differ significantly.

(a) Particle Therapy Beam Delivery Improvements
Technical Contact: Michael Zisman, (301)-903-2718,
Michael.Zisman@science.doe.gov

Even with less than fully optimized treatment techniques, there have been reports of impressive local control rates using particle beam therapy for otherwise difficult-to-treat cancers. Although lower-cost proton beam options are starting to appear, today's proton beam facilities are costly to build and thus are not widely available. Based on their potential biological advantage, there is now increasing medical interest in exploring the use of other light ions for therapy; typically, beams up to carbon are considered.

While beam delivery ("gantry") systems for proton beams have been designed and constructed previously, they are typically large, massive, and costly. Accommodating heavier beams, up to carbon, with similar technology requires delivery systems that are even more massive.

Short dose deposition times, on the order of seconds, will require fast and efficient scanning in all three spatial dimensions. This will place new demands on the accelerator, beam line and detector systems to guide and verify dose placement.

Ion beam therapy also comes with unique challenges, requirements and opportunities for imaging. There is a big gap between imaging capabilities of today and imaging needs for future ion beam therapy facilities. This gap needs to be bridged in order to fully exploit the potential of ion beam therapy. For conventional photon therapy, it suffices (to first order) to know the tumor position at every moment in time, whereas proton and ion beam therapy additionally require dynamic knowledge of the surrounding anatomy, because those tissues affect the range of the

beam. Ideally, the range of the beam will be directly observed with "range imaging" techniques. Ultimately, in order to capture the temporal-spatial (4D) dose distribution, it would be desirable to know the 4D distribution of stopping power of the tumor and normal tissues with great precision.

Proposals in this topical area should address ideas for providing one or more of the following:

1. less massive and more compact beam delivery systems capable of delivering ion beams from protons up to carbon that are suitable for patient therapy
2. technology that can provide for rapid (seconds) scanning of the beam over a tumor volume in three dimensions, that is both transversely and longitudinally
3. beam diagnostic technologies for ion beam therapy, with emphasis on increased readout speed and accuracy of position and dose

To meet the teaming requirement, applications under this Track 1 topic area **are strongly encouraged to** include significant participation from each of the following: (1) an institution with technical leadership in a relevant accelerator technology, (2) a medical institution with clinical experience in imaging and treatment for external beam radiotherapy (EBRT), and (3) a domestic company currently marketing EBRT products. Applications lacking significant participation from either a clinical or accelerator technology partner and/or lacking an industry partner may score poorly under merit review.

The Particle Therapy Beam Delivery Improvements program of this FOA does **not** request designs for accelerators themselves, but covers only ancillary devices that work in conjunction with an accelerator. Proposals to design an accelerator or accelerator complex are outside the scope of this call, and such proposals will be declined without review. Designs that are independent of the proton or ion beam accelerator, such that they can work with more than one type of accelerator, are preferred.

PIs are strongly encouraged to review the report of the recent workshop on Ion Beam Therapy, held January 9-11, 2013. The report provides an overview of the technical issues and required R&D to develop accelerator technologies for ion beam treatment of cancer. The report is available online at http://science.energy.gov/~/media/hep/pdf/accelerator-rd-stewardship/Workshop_on_Ion_Beam_Therapy_Report_Final_R1.pdf.

(b) Ultrafast Laser Technology Program
Technical Contact: Eric Colby, 301-903-5475, Eric.Colby@science.doe.gov

Lasers are used or proposed for use in many areas of accelerator applications: as drivers for novel accelerator concepts for future colliders; in the generation, manipulation, and x-ray seeding of electron beams; in the generation of electromagnetic radiation ranging from THz to gamma rays; and in the generation of neutron, proton, and light ion beams. In many cases, ultrafast lasers with pulse lengths well below a picosecond are required, with excellent stability, reliability, and beam quality. With applications demanding ever-higher fluxes of particles and radiation, the driving laser technology must also increase in repetition rate—and hence average power—to meet the demand.

These applications have some general technological requirements in common:

- Ultrafast pulses (<1 ps)
- High average powers (>1 kW up to 100 kW or more)
- Diffraction limited beams
- Good (ps) to excellent (fs) pulse timing
- Robust and reliable operation

Many important applications also require, or can benefit from:

- High pulse energy (>0.01 J up to 1 kJ)
- High pre-pulse power contrast (better than10^{-9})
- High wall plug efficiency (>20% with a goal of 30% or higher)
- Longer laser wavelengths (>1.5 μm out to 10 μm)

The primary goals of the Ultrafast Laser Technology Program are to develop the enabling technologies that will ultimately lead to construction of demonstration prototypes for one or more of the principal types of ultrafast lasers needed for accelerator applications, and to enhance industry's capability to produce the necessary technologies. Ultrafast lasers for accelerator applications fall into four basic laser types, summarized in Table 1 below.

Table 1. Target performance parameters for the four principal types of ultrafast lasers

	Type I	**Type II**	**Type III**	**Type IV**
Wavelength (μm)	1.5-2.0	0.8-2.0	2.0-5.0	2.0-10.0
Pulse Energy	3 μJ	3 J	0.03–1 J	300 J
Pulse Length (fs)	300	30–100	50	100–500
Repetition Rate	1–1000 MHz	1 kHz	100 kHz	100 Hz
Average Power (kW)	Up to 3	3	3 and up	30
Energy Stability	<1%	<0.1%	<1%	<1%
Beam Quality	M^2<1.1	Strehl>0.95	M^2<1.1	M^2<1.1
Wall-plug Efficiency	>30%	>20%	>20%	>20%
Pre-Pulse Contrast	N/A	$>10^{-9}$	N/A	$>10^{-9}$
CEP-capable	Required	N/A	Required	N/A
Optical Phase Noise	$<5^{o}$	N/A	$<5^{o}$	N/A
Wavelength Tunability Range	0.1%	0.1%	10%	0.1%

- Type I laser systems, used both to directly power laser-driven accelerators-on-a-chip, and as subassemblies of coherently combined fiber arrays used to generate higher pulse energies.

- Type II laser systems, used to excite plasma waves for particle trapping and high gradient acceleration, and for the generation of x-rays through Compton backscattering.

- Type III laser systems, used for generating high repetition rate radiation pulses through nonlinear processes, particularly high-harmonic generation (HHG).

- Type IV laser systems, used for plasma-based sources of protons, light ions, and neutrons.

This initial phase of the Laser Technology Program will concentrate on basic research and engineering design studies to produce the breakthroughs in technology and design architecture necessary to make each of the four laser types practical. Grant applications are sought in these five topical areas:

(1) **Ultrafast gain materials capable of very high average power.** Development of materials suitable for fiber or bulk usage, supporting amplification of <100 fs pulses, with excellent thermal conductivity, low thermal lensing, low saturation fluence, high damage threshold and small quantum defect will be key to increasing average power capabilities of ultrafast lasers. Materials must be scalable to average powers in the kilowatt range and above while maintaining excellent beam quality.

(2) **Increased robustness and reduction in size of optical components.** Each will reduce the cost of ultrafast laser systems. Development of ultrafast optical coatings and materials capable of supporting <100 fs laser pulses with significantly increased damage threshold, excellent thermal stability, and low loss and low scatter will permit more compact, higher reliability ultrafast lasers to be developed.

(3) **Innovations in laser architectures, cryogenics, other advanced thermal management techniques.** Direct diode pumping, coherent combination, hybrid fiber/bulk systems, and the use of advanced cryogenic systems will be needed to significantly increase the average power performance of ultrafast lasers.

(4) **Wavelength extension further into the infrared.** The development of efficient, robust, cost-effective ultrafast laser systems out to 10 microns in wavelength will enable new applications such as solid-state seeding for ultrafast CO_2 lasers and driving HHG hard x-ray generators, as well as open new opportunities in plasma acceleration and high harmonic generation. Significant increases in repetition rate are needed to achieve high average power.

(5) **Improvements in laser quality.** Advances in pulse contrast, optical phase noise, flexible pulse shaping (both transverse and longitudinal), and precision synchronization to external references will directly impact both the quality and capability of the laser-based sciences.

This Ultrafast Laser Technology Program of this FOA includes initial R&D to identify promising technical avenues for developing ultrafast lasers of the four types discussed above. It does **not** include the engineering and construction of full-scale demonstration laser systems for any of the four types during this initial phase. Proposals to develop full-scale demonstration laser systems are out of the scope of this FOA, and will be declined without review.

To meet the teaming requirement, applications under this Track 1 topic area **are strongly**

encouraged to include significant participation from each of the following: (1) an institution with technical leadership in a relevant laser technology, and (2) an institution with technical leadership in the application of laser technology to accelerators and/or a domestic company currently marketing related laser products. Applications lacking significant participation from a laser technology or accelerator technology partner, or an industry partner, may score poorly under merit review.

PIs are strongly encouraged to review the report of the recent workshop on Laser Technology for Accelerators, held January 23–25, 2013. The report provides an overview of the technical issues and required R&D to develop ultrafast laser technology for accelerator applications. The report is available online at http://science.energy.gov/~/media/hep/pdf/accelerator-rd-stewardship/Lasers_for_Accelerators_Report_Final.pdf.

(c) Energy Efficiency Improvements compatible with Office of Science Accelerators
Technical Contact: Eric Colby, (301)-903-5475, Eric.Colby@Science.doe.gov

Executive Order 13514, together with DOE's 2010 Strategic Sustainability Performance Plan, mandate a 28% reduction in greenhouse gas emissions from DOE-owned facilities by 2020, when compared with the baseline year 2008. Current DOE Office of Science accelerators consume roughly ~1 TW-hr/yr of electricity.

Magnet and RF power sources consume a majority of the total power for large accelerators. Improving the power efficiency of these sources can yield significant operational savings over the lifetime of an accelerator.

Grant applications are sought for R&D leading to new concepts in very high efficiency power conversion systems in two categories:

1. ***Plug-Compatible Concepts***
   Developments in this area are targeted at upgrading existing power supplies, modulators and/or klystrons that are currently in service. Designs must be as close to plug-compatible as possible.

2. ***Revolutionary Concepts***
   Developments in this area must offer revolutionary gains in efficiency. While plug-compatibility is not required, a cost/benefit analysis must be included in the application to support the claim that the differential cost of developing, deploying, and operating the new power system components will generate a positive return on investment over a 10-year time period.

Applications in this area may propose the use of Office of Science facilities to test their approaches and concepts, but any technologies, techniques, concepts, or other products will remain the property of their inventors or the relevant applicant. Concepts proposed in this area must be of potential utility to any operators of large magnets or RF power sources.

To meet the teaming requirement, applications under this Track 1 topic area **are strongly**

encouraged to include significant participation from each of the following: (1) an institution with technical leadership in a relevant accelerator technology, and (2) a domestic company currently marketing related power conversion technology. Applications lacking significant participation in either of these two areas may score poorly under merit review.

Track 2: Long-Term Generic Accelerator R&D
Technical Contact: Michael Zisman, (301)-903-2718, Michael.Zisman@science.doe.gov

Long-term generic accelerator R&D is basic research aimed at improving the theory, computational tools, and fundamental physical and technical understanding of accelerator science. Note that more restrictive eligibility requirements apply to this topic—see section III.A for further information. Individual principal investigators or collaborations may apply, and are expected to develop a research proposal.

Advancements in basic accelerator science and technology enable new capabilities in virtually every area of accelerator application. Grant applications are sought for high-impact advances in the following general areas: beam physics, advanced computational methods for accelerator design and analysis, beam diagnostics and feedback control, new superconducting materials, new materials and coatings for accelerator components, novel power sources for accelerators, new particle sources, novel magnet designs, novel lattice designs, and novel technologies for secondary beam production. Applications that will lead to significant increases in performance (flux, brightness, polarization, coherence, stability, reliability, flexibility) and decreases in cost (construction cost, operating cost, physical size, complexity) are sought.

While R&D in this area is often far upstream of application, the areas where the research will have greatest impact can generally be identified. This topic area is distinct from the HEP Comparative Review FOA (DE-FOA-0001140) in that R&D funded here will be expected to impact a broader set of accelerator applications beyond those of High Energy Physics.

In addition to the standard merit criteria applied to all scientific grant applications, grant applications submitted under Track 2 will be specifically reviewed for (1) the strength and breadth of the research team and (2) the quality of the research plan. See section V.A.2 for a description of the Merit Review Criteria.

Grant applications may **not** apply to both Track 1 and Track 2 simultaneously, as the work profile, eligibility requirements, and proposal formats differ significantly.

APPLICATION REQUIREMENTS

All applications submitted to this Funding Opportunity Announcement (FOA) must address one of the research topic areas described in the previous section. Further, all applications must conform to the format specified in Section IV of this FOA; each proposal will be pre-screened for responsiveness to the research area descriptions and for compliance with the application requirements.

Section II – AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT

DOE anticipates awarding grants under this FOA.

B. ESTIMATED FUNDING

It is anticipated that approximately $10,000,000 will be available for all Accelerator R&D Stewardship new and renewal awards in FY 2015, subject to the availability of appropriated FY 2015 funds. The number, duration and size of awards will depend on the number of applications selected for award, and the actual amount of funds available in FY 2015. Out of the approximately $10,000,000 in total funding, up to approximately $1,500,000 may be awarded in the Track 2 topic area of Long-Term Generic Accelerator R&D.

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

C. MAXIMUM AND MINIMUM AWARD SIZE

(See B. Estimated Funding Section above.)

D. EXPECTED NUMBER OF AWARDS

(See B. Estimated Funding Section above.)

E. ANTICIPATED AWARD SIZE

(See B. Estimated Funding Section above.)

F. PERIOD OF PERFORMANCE

(See B. Estimated Funding section above.)

G. TYPE OF APPLICATION

DOE will accept new and renewal applications under this FOA. Please see ***Definitions*** and ***Additional Guidance*** below for assistance in determining if a renewal application is appropriate.

Definitions:

New Application: A new application is: 1) an application for funding to create a new research grant that has not previously received DOE funding, including any funding for the current year, 2) an application for continued research from the same sponsoring institution as the current grant but with a significant change in scientific research thrust; or 3) an application to continue

research performed under an existing DOE grant award but with a new sponsoring institution.

Renewal Application: A renewal application is an application requesting additional funding for an existing DOE grant award for a period subsequent to that provided by a current award and with no change in the senior investigator(s) listed on the 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. **Renewal applications must be submitted by the same sponsoring institution as that holding the current grant award for which renewal funding is requested, and the proposed research topic must be a logical scientific extension of the research that has been performed in the current award.** A renewal application must be marked as such on the SF-424 (R&R) cover page and the current award number must be marked in the appropriate space.

Additional Guidance for Sponsoring Institutions:

Those institutions with an *existing* DOE grant award:

1) containing a research thrust with the same research scope and continuing leadership, now submitting an application to this FOA, must prepare the application as a **renewal**, *unless* the start date of the original award project period precedes 2012.
2) containing a research thrust with same research scope and continuing leadership, now submitting an application to this FOA, *and* the start date of the original award project period precedes 2012, must prepare the application as **new**.
3) containing a research thrust and continuing leadership but now with different research scope, now submitting an application this FOA, must prepare the application as **new**.
4) containing a research thrust and with different research scope and leadership, now submitting an application to this FOA, must prepare the application as **new**.
5) spanning multiple tracks or topic areas, which are now planning to submit separate applications to this FOA, where each application corresponds to a particular track or thrust, must each submit **new** applications, including the application of the lead senior investigator under the existing DOE grant.

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

For grant awards, the value of, and funding for, a DOE/NNSA National Laboratory contractor, a non-DOE/NNSA 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 field work 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.

Section III – ELIGIBILITY INFORMATION

A. ELIGIBLE APPLICANTS

The intent of this program is to strengthen the capabilities of the U. S. in accelerator technology applications to discovery science, medicine, industry, energy & environment, and security applications.

Nonprofit organizations described in section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995, are not eligible to apply for funding under either Track.

Each Track has specific eligibility requirements.

Track 1: Accelerator Stewardship Topical Areas

Applications for activities in Track 1: Accelerator Stewardship Topical Areas will be accepted from all responsible domestic organizations capable of meeting the objectives of this FOA, with the exception of U. S. Department of Energy National Laboratories. For DOE National Laboratories, there is a separate, companion announcement (LAB 14-1142).

Track 2: Long-Term Generic Accelerator R&D

Applications for activities in Track 2: Long-Term Generic Accelerator R&D will only be accepted from regionally-accredited U.S. academic institutions or domestic nonprofit organizations subject to section 501 (c)(3) of the Internal Revenue Code.

B. COST SHARING

Cost sharing is not required, but a demonstration of institutional commitment to the proposed activity is strongly encouraged for all applications, especially for Track 1 applicants. The institutional commitment may take the form of uncompensated effort; the provision of surplus materials, supplies, or equipment; the provision of access to facilities at no or reduced cost; voluntary cost sharing; mentoring, training, or coaching of personnel; or other methods of involving the applicant institution in the proposed activity.

Reviewers will be asked to evaluate the strength of the collaboration proposing the work; for Track 1 applications, the demonstration of institutional commitment will be taken as evidence of the Stewardship customer's interest in the outcome. See section V.A.2.

C. ELIGIBLE INDIVIDUALS

Individuals with the skills, knowledge, and resources necessary to carry out the proposed research as a Program Director/Principal Investigator are invited to work with their organizations and an appropriate set of collaborating institutions to develop an application for assistance.

Individuals from underrepresented groups as well as individuals with disabilities are always encouraged to apply for assistance.

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 http://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-0001142**) shown on the cover of this FOA and then follow the prompts to download the application package.

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

B. LETTER OF INTENT AND PRE-APPLICATION

1. Letter of Intent

LETTER OF INTENT DUE DATE
July 3, 2014, at 5 PM Eastern Time

A Letter of Intent (LOI) is required and should be submitted by **July 3, 2014, at 5 PM Eastern Time** . Letters of Intent will not be accepted after this time. Applications submitted by the application deadline of **September 4, 2014, at 11:59 PM Eastern Time** will be declined without review if no prior LOI was submitted.

The LOI must include the following:

- A cover sheet with the following information:
  i. Funding Opportunity Announcement (FOA) Number: **DE-FOA-0001142**
  ii. Title of the planned research application
  iii. Name of Lead Principal Investigator and Job Title
  iv. Name and mailing address of the sponsoring institution
  v. E-mail address and telephone number of the Principal Investigator
  vi. Additional Senior Investigator(s) and Senior/Key personnel expected to be involved in the planned application
  vii. Administrative Point of Contact, Telephone number, and E-mail address
  viii. Indicate type of application planned: New or Renewal
  ix. Indicate # year(s) for proposal project period for the planned application (typically 3 years)
  x. Track # for the planned application as specified in Section I of this FOA
  xi. Topical area for the planned application, as specified in Section I of this FOA
  xii. Relevant DOE Technical Contact name(s) as listed in Section I of this FOA

- An overview of the research plan limited to two pages. This overview should include:
  i. Background information: Why is the proposed work important? What experience does the group have working in this area?
  ii. Proposed Research: What will be accomplished? What methods will be used? Why is the approach superior to existing approaches?

iii. Statement of Work: At a high level, what are the main tasks to be accomplished?
iv. Description of results, products: What scientific and/or technical advances will result? How will the results be a significant advance over existing knowledge or techniques? How will the results be captured? (scientific papers, prototypes, patents, software packages, etc.)?
v. Teaming and Management Plan: With whom will you plan to team? What unique advantages does your group or team have? How do the group/team participants reflect the range of skills needed to complete the proposed research? How will the effort be managed?
vi. Cost, Schedule, Milestones: Provide a high-level description of the cost, schedule, and major milestones of the proposed work.

Only those applicants that submit a LOI by the due date are eligible to submit a full application under this FOA.

Letters of Intent 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 full applications by **July 10, 2014, at 5 PM Eastern Time**. Applicants who have not received a response regarding the status of their LOI review by this date are responsible for contacting the program to confirm this status. **Only those applications that receive notification from DOE encouraging a full application may submit full applications.** No other full applications will be considered.

The LOI must be submitted electronically through the DOE Office of Science Portfolio Analysis and Management System (PAMS) website https://pamspublic.science.energy.gov/. It is important that the LOI be a single file with extension .pdf, .docx, or .doc. The Principal Investigator (PI) and anyone submitting on behalf of the PI must register for an account in PAMS before it will be possible to submit a letter of intent. **All PIs and those submitting LOIs on behalf of PIs are encouraged to establish PAMS accounts as soon as possible to avoid submission delays or missed deadlines.**

To access PAMS, you may use the Internet Explorer, Firefox, Google Chrome, or Safari browsers.

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 the "Having Trouble Logging In?" 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. (Hint: If your institution has an acronym, such as UCLA for the Regents of the University of California, Los Angeles, you may search for the acronym under "Institution Name like." Many institutions with acronyms are listed in PAMS with their acronyms in parentheses after their names.)
- Find your institution in the list that is returned by the search and click the "Actions" link in the Options column next to the institution name to obtain a dropdown list. Select "Add me to this institution" from the dropdown. PAMS will take you to the "Institutions – List" page.
- If you do not see your institution in the initial search results, you can search again by clicking the "Cancel" button, clicking the Option 2 link, and repeating the search.
- If, after searching, you think your institution is not currently in the database, click the "Cannot Find My Institution" button and enter the requested institution information into PAMS. Click the "Create Institution" button. PAMS will add the institution to the system, associate your profile with the new institution, and return you to the "Institutions – List" page when you are finished.

Submit Your Letter of Intent:

- Create your Letter of Intent outside the system and save it as a file with extension .docx, .doc, or .pdf. Make a note of the location of the file on your computer so you can browse for it later from within PAMS.
- Log into PAMS and click the Proposals tab. Click the "View / Respond to Funding Opportunity Announcements" link and find the current announcement in the list. Click the "Actions/Views" link in the Options column next to this announcement to obtain a dropdown menu. Select "Submit Letter of Intent" from the dropdown.
- On the Submit Letter of Intent page, select the institution from which you are submitting this LOI from the Institution dropdown. If you are associated with only one institution in the system, there will only be one institution in the dropdown.
- Note that you must select one and only one Principal Investigator (PI) per LOI; to do so, click the "Select PI" button on the far right side of the screen. Find the appropriate PI from the list of all registered users from your institution returned by PAMS. (Hint: You may have to sort, filter, or search through the list if it has multiple pages.) Click the "Actions" link in

the Options column next to the appropriate PI to obtain a dropdown menu. From the dropdown, choose "Select PI."

- If the PI for whom you are submitting does not appear on the list, it means he or she has not yet registered in PAMS. For your convenience, you may have PAMS send an email invitation to the PI to register in PAMS. To do so, click the "Invite PI" link at the top left of the "Select PI" screen. You can enter an optional personal message to the PI in the "Comments" box, and it will be included in the email sent by PAMS to the PI. You must wait until the PI registers before you can submit the LOI. Save the LOI for later work by clicking the "Save" button at the bottom of the screen. It will be stored in "My Letters of Intent" for later editing.
- Enter a title for your Letter of Intent.
- Select the appropriate technical contact from the Program Manager drop-down.
- To upload the LOI file into PAMS, click the "Attach File" button at the far right side of the screen. Click the "Browse" (or "Choose File" depending on your browser) button to search for your file. You may enter an optional description of the file you are attaching. Click the "Upload" button to upload the file.
- At the bottom of the screen, click the "Submit to DOE" button to save and submit the LOI to DOE.
- Upon submission, the PI will receive an email from the PAMS system <PAMS.Autoreply@science.doe.gov> acknowledging receipt of the LOI. Make sure to add this contact to your address book to prevent this e-mail from being marked as spam.

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

For help with PAMS, click the "External User Guide" link on the PAMS website, https://pamspublic.science.energy.gov/. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, Email: sc.pams-helpdesk@science.doe.gov. All submission and inquiries about this Funding Opportunity Announcement should reference **DE-FOA-0001142.**

C. CONTENT AND APPLICATION FORMS

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 attach PDF portfolios.

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.

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., 10 CFR 600, 10 CFR 602
Buy American Act	41 USC 10 et seq.
Cargo Preference Act	46 USC 55305, 46 CFR 381.7
Civil Rights Protections	10 CFR 1040, 10 CFR 600
Debarment and Suspension	10 CFR 600, 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, 10 CFR 600
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., 10 CFR 600
Human Research Subjects Protections	10 CFR 745, 10 CFR 600
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 in the "Research and Related Other Project Information" Form.

The following six questions must be answered:
1. Are Human Subjects Involved?
2. Are Vertebrate Animals Used?
3. Is proprietary/privileged information included in the application?
4. Does this project have an actual or potential impact on the environment?
5. Is the research performance site designated, or eligible to be designated, as a historic place?
6. Does this project involve activities outside of the United States or partnership with international collaborators?

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

PROJECT SUMMARY/ABSTRACT (FIELD 7 ON THE FORM)

The project summary/abstract must contain a summary of the proposed activity suitable for dissemination to the public. It should be a self-contained document that identifies the name of the applicant, the project director/principal investigator(s) (PD/PI), the project title, the site(s) where research will be conducted (for experimental-based proposals), the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (i.e., benefits, outcomes), and major participants (for collaborative projects). A sample is provided below:

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

The project summary must not exceed 1 page when printed using standard 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 Announcement (FOA) Number: **DE-FOA-0001142**
- DOE/Office of Science Program Office: **Office of High Energy Physics**
- DOE/Office of Science Program Office Technical Contact: **SC.HEPFOA@science.doe.gov or the appropriate Technical Contact listed in Section I under the Supplementary Information subsection in this FOA.**
- PAMS Letter of Intent or Pre-proposal tracking number (if applicable):
- Research Track as identified in Section I of this FOA:
- Topical Area as identified in Section I of this FOA :

COVER PAGE SUPPLEMENT FOR COLLABORATIONS
(PART OF PROJECT NARRATIVE ATTACHED TO FIELD 8 ON THE FORM)

Collaborative applications submitted from different institutions must clearly indicate they are part of a collaborative project/group. **Track 1 authors are strongly encouraged to include collaborating institutions, and Track 2 proposals may include collaborating** institutions. Every partner institution must submit an application through its own sponsored research office. Each collaborative group can have only one lead institution. Each application within the collaborative group, including the narrative and all required appendices and attachments, must be identical with the following exceptions:

- Each application must contain a correct SF-424 (R&R) cover page for the submitting institution only.
- Each application must contain a unique budget corresponding to the expenditures for that application's submitting institution only.
- Each application must contain a unique budget justification corresponding to the expenditures for that application's submitting institution only.

Collaborations that include a DOE National Laboratory should note that proposals from a DOE National Laboratory should be submitted in response to the companion laboratory announcement (LAB 14-1142) in PAMS.

Each application belonging to a collaborative group should have the same title in Block 11 of the SF 424 (R&R) form.

The Office of Science will use the multiple applications associated with a collaborative group to create one consolidated document for merit review that consists of the common, identical application materials combined with a set of detailed budgets from the partner institutions. It is very important that every application in the collaborative group be identical (including the title) with the exception of the budget and budget justification pages.

If the project is a collaboration, provide the following information on a separate page as a supplement to the cover page.

- List all collaborating institutions by name with each institution's principal investigator on the same line.
- Indicate the lead PI who will be the point of contact and coordinator for the combined research activity.
- Provide a statement explaining the leadership structure of the collaboration.
- Include a description of each collaborating institution's facilities, equipment, and resources that will be made available to the collaborative group.
- If applicable, explain how students and junior researchers will be trained and mentored by the collaborators.

Include a table modeled on the following chart providing summary budget information from all collaborating institutions. Provide the total costs of the budget request in each year for each institution and totals for all rows and columns. If necessary, modify the table below for the correct number of years.

Name and Yearly Budget for Proposals with Multiple Collaborating Institutions

	Name	Institution	Year 1 Budget	Year 2 Budget	Year 3 Budget	Total Budget
Lead PI						
Co-PI						
Co-PI						
Co-PI						

PROJECT NARRATIVE (FIELD 8 ON THE FORM)

The project narrative **must not exceed a total of 16 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.

- For each senior investigator, clearly indicate the fraction of total research time during the academic year as well as summer that will be spent on the proposed research.
- References needed to cite the research described in the 16 pages of narrative can be listed in the Appendix material described below.

Merit reviewers will only consider the number of pages specified in the above requirement. Applications exceeding the 16-page limit will not be reviewed and, therefore, won't be considered for funding.

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

The narrative required depends on the Track to which the grant application is being submitted. Read this section carefully to understand the appropriate format and content to include.

Narrative Format for Track 1: Accelerator Stewardship Topical Areas

Track 1 grant applications must include the following sections, with a recommended page length for each section indicated in braces:

A. {1 page} Background/Introduction. Explanation of the importance and relevance of the proposed work as well as a review of the relevant literature. A brief description of research activities conducted by the primary team members and their R&D groups, including accomplishments and impacts made during the recent past (typically the past three years), is also encouraged.

B. {6 pages} Proposed Research, Innovative Claims, Technical Rationale, and Approach. If appropriate, identify the hypotheses to be tested and details of the methods to

be used. This section should describe the scientific and technical challenges, unique approach(es), and potential anticipated technical solutions in the topical area that will be addressed. Proposals should clearly explain the technical approach(es) that will be employed and provide ample justification for their feasibility. This section should demonstrate that the proposer has a clear understanding of the state-of-the-art, and it should provide sufficient technical details to permit complete evaluation of the feasibility of the approach. Additionally, comparison with other ongoing research efforts should be provided indicating advantages and disadvantages of the proposed effort.

C. {2 pages} Program Plan & Risk Assessment. A narrative explaining the explicit timelines, milestone achievements, and quantitative metrics by which progress toward the goals can be evaluated. The proposed period of performance of the overall program, and each program phase, should be clearly stated. The narrative should include a specific plan detailing how all program metrics will be accurately assessed. This section should also identify major technical risk elements specific to the proposed approach, estimate the risk magnitude for each such element, and describe specific plans to mitigate risk.

D. {1 page} Statement of Work. Clearly and concisely define the technical work to be performed on a task-by-task basis, listing the durations and the dependencies among the tasks. The statement of work **must** include a table defining the program metrics to be applied.

For each task, provide:

- A general description of its objective;
- A detailed description of the approach to be taken to accomplish it;
- Identification of the primary organization responsible for task execution (prime, sub, team member, by name, etc.);
- The completion criteria for each task/activity – a product, event, or milestone that defines its completion.

E. {2 pages} Description of the results, products, transferable technology, and expected technology transfer path. Summary of objectives associated with the proposed research and, where appropriate, the plans and capability to accomplish technology transfer and commercialization. If this application has a commercial product as the end goal, clearly describe the market opportunity. If intellectual property rights will be reserved and assigned, describe the expected assignment of such rights, the measures to be used to protect proprietary information, and include relevant agreements in Appendix 7: Other Attachments . See also Section VIII. “Intellectual Property” for instructions on marking proprietary information in the application.

F. {2 pages} Teaming and Management Plan. A clearly defined organization chart for the program team that includes, as applicable: (1) the programmatic relationship of the primary team member; (2) the unique capabilities of the primary team members; (3) the task responsibilities of the primary team members; (4) the teaming strategy among the team members; and (5) the key personnel along with the amount of effort to be expended by each person during each year. Please include in Appendix 7: Other Attachments

any formal teaming agreements that are required to execute this plan.

G. {2 pages} Cost, schedule, and measurable milestones for the proposed research, including estimates of cost for each task in each year of the effort, broken down by the primes and major subcontractors, total cost, and any cost sharing. (Note: Measurable milestones should capture key development points in tasks and should be clearly articulated and defined in time relative to start of effort.) Where the effort consists of multiple portions which could reasonably be partitioned for purposes of funding, these should be identified as options with separate cost estimates for each.

Narrative Format for Track 2: Long-Term Generic Accelerator R&D

Track 2 grant applications must include the following sections. Note that the **16**-page limit also applies to applications submitted under Track 2.

Background/Introduction: Explanation of the importance and relevance of the proposed work as well as a review of the relevant literature. Describe the application(s) that are most likely to be impacted by this work, citing prior workshops, studies, white papers, or other documented evidence of the need for progress in this application area. A brief description of research activities conducted by the Principal Investigator and his/her group, including specific roles and responsibilities in collaborative research efforts, and accomplishments and impacts made during the recent past (typically the past three years), is also encouraged.

Multiple Investigators: In applications with more than one senior investigator, the accomplishments, milestones, and plans of each senior investigator must be clearly identified. Reviewers will be asked to assess the accomplishments and plans of each senior investigator and these evaluations will be used as input to the funding decisions.

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

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

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

General Instructions That Apply to Both Track 1 and Track 2 Grant Applications

It is important that the project narrative section provide a complete description of the proposed work, because reviewers are not obliged to read the last Appendix in any detail. Applications exceeding the page limits will be declined without review. The page count of 16 pages does not include the Cover Page and Budget Pages, the Title Page, the biographical material and publication information, or any Appendices.

Do not include in any section or any appendix of the application any sensitive personally identifiable information (PII) 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. Applications containing PII will be declined without review.

For Collaborative Proposals Only: Each collaborating institution must submit an identical common narrative. The common narrative must identify which tasks and activities will be performed by which of the collaborating institutions in every budget period of the proposed project. The budget and the budget justification—which are unique to each collaborating institution—may refer to parts of the common narrative to further identify each collaborating institution's activities in the joint project. There should be no ambiguity about each institution's role and participation in the collaborative group.

The Office of Science will use the multiple applications associated with a collaborative group to create one consolidated document for merit review that consists of the common, identical application materials combined with a set of detailed budgets from the partner institutions. It is very important that every application in the collaborative group be identical (including the title) with the exception of the budget and budget justification pages.

APPENDIX 1: BIOGRAPHICAL SKETCH – PROJECT DIRECTOR / PRINCIPAL INVESTIGATOR AND SENIOR / KEY PERSONNEL

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

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

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

- **Collaborators and Co-editors**: List in alphabetical order all persons, including their current organizational affiliation, who are, or who have been, collaborators or co-authors with you on a research project, book or book article, report, abstract, or paper during the 48 months preceding the submission of this application. For publications or collaborations with more than 10 authors or participants, only list those individuals in the core group with whom the Principal Investigator interacted on a regular basis while the research was being done. Also, list any individuals who are currently, or have been, co-editors with you on a special issue of a journal, compendium, or conference proceedings during the 24 months preceding the submission of this application. If there are no collaborators or co-editors to report, state "None."
- **Graduate and Postdoctoral Advisors and Advisees**: List the names and current organizational affiliations of your graduate advisor(s) and principal postdoctoral sponsor(s). Also, list the names and current organizational affiliations of your graduate students and postdoctoral associates.
- **Advisory Committees:** List all advisory committees on which the senior investigator serves, including the name of the institution and department (if applicable).

Personally Identifiable Information (PII): Do not include sensitive personally identifiable information such as a Social Security Number, date of birth, or city of birth. Do not include information that a merit reviewer should not make use of. Applications containing PII will be declined without review.

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. For each organization providing support, show the total award amount for the entire award period (including indirect costs) and the number of person-months per year to be devoted to the project by the senior/key person. Do not list simply the title of the current and/or pending grant; provide the "Project Abstract," which includes brief details on the scope of research. A level of detail sufficient to identify similarities and differences with the work presented in the application being submitted is required. 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 (2011). You may also use this convention in the proposal bibliography. 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: ENCOURAGE RESPONSE FROM DOE

Full proposals will only be considered for funding if (1) a Letter of Intent meeting the requirements of section IV.B.1 is submitted by the deadline and (2) the applicant receives an "encourage" response from the DOE. Include in this appendix the "encourage" response received from the DOE.

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

APPENDIX 7: OTHER ATTACHMENTS

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.

For Track 1 grant applications, include in this appendix documents which support the teaming arrangements, intellectual property sharing arrangements, and so on. Examples include letters from subcontractors/consultants indicating availability and expected charges to work on the project, teaming agreements, non-disclosure agreements, IP sharing agreements, etc.

Reviewers may not have time to read extensive appendix materials with the same care they would use with the application proper.

- Do not include copies of previously presented and/or published research papers, technical notes, and/or reports written for respective experiments or collaborations. Further, do not include presentations made at any meetings or conferences
- Do not attach a separate file.
- This appendix will not count in the project narrative page limitation.

- **Do not attach any of the requested appendices described above as files for fields 9, 10, 11, and 12. Instead, follow the above instructions to include the information as appendices to the project narrative file.**
- **These appendices will not count toward the project narrative's page limitation.**

3. Research And Related Budget

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

Budget Fields

Section A Senior/Key Person	For each Senior/Key Person, enter the requested information. List personnel, base salary, the number of months that person will be 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 **each** item of equipment separately and justify each in the budget justification section: do not aggregate items. Allowable items ordinarily will be limited to research equipment and apparatus not already available for the conduct of the work. General-purpose office equipment is not eligible for support unless primarily or exclusively used in the actual conduct of scientific research.
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	• **Materials and Supplies:** Enter total funds requested for materials and supplies in the appropriate fields. In the budget justification, indicate general categories such as glassware, and chemicals, including an amount for each category (items not identified under "Equipment"). Categories less than $1,000 are not required to be itemized. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). • **Publication Costs:** Enter the total publication funds requested. The proposal budget may request funds for the costs of documenting,

	preparing, publishing or otherwise making available to others the findings and products of the work conducted under the award. In the budget justification, include supporting information. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). • **Consultant Services:** Enter total funds requested for all consultant services. In the budget justification, identify each consultant, the services he/she will perform, total number of days, travel costs, and total estimated costs. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). • **ADP/Computer Services:** Enter total funds requested for ADP/Computer Services. The cost of computer services, including computer-based retrieval of scientific, technical and education information may be requested. In the budget justification, include the established computer service rates at the proposing organization if applicable. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). • **Subawards/Consortium/Contractual Costs:** Enter total costs for all subawards/consortium organizations and other contractual costs proposed for the project. In the budget justification, justify the details. • **Equipment or Facility Rental/User Fees:** Enter total funds requested for Equipment or Facility Rental/User Fees. In the budget justification, identify each rental/user fee and justify. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). • **Alterations and Renovations:** Enter total funds requested for Alterations and Renovations. In the budget justification, itemize by category and justify the costs of alterations and renovations, including repairs, painting, removal or installation of partitions, shielding, or air conditioning. Where applicable, provide the square footage and costs. • **Other:** Add text to describe any other Direct Costs not requested above. Enter costs associated with "Other" item(s). Use the budget justification to further itemize and justify.
Section G Direct Costs	This represents Total Direct Costs (Sections A through F)
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

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 cumulative R&R budget for each subawardee that is expected to perform work estimated to be more than $100,000 or 50 percent of the total work effort (whichever is less). If you are selected for award, you must submit a multi-year budget for each of these subawardees (See Section IV.D for submission of Subawardees' multi-year budgets). 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).

If the project involves more subawardees than there are places in the SUBAWARD BUDGET ATTACHMENT(S) FORM, the additional subaward budgets may be saved as PDF files and appended to the Budget Justification attached to Field K.

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

5. Project/Performance Site Location(s)

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

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

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

6. SF-LLL Disclosure of Lobbying Activities

If applicable, complete SF-LLL. Applicability: If any funds other than Federal appropriated

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

7. Summary of Required Forms/Files

Your application must include the following items:

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

D. SUBMISSIONS FROM SUCCESSFUL APPLICANTS

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

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

E. SUBMISSION DATES AND TIMES

1. Letter of Intent Deadline

July 3, 2014, at 5 PM Eastern Time

2. Pre-application Deadline

None

3. Application Deadline

September 4, 2014, at 11:59 PM Eastern Time

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

4. Late Submissions

Applications received after the deadline will not be reviewed or considered for award.

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 is contingent upon the availability of funds appropriated by Congress for the purpose of this program. Anticipated future year funding is contingent upon the availability of budget authority for future years.

Cost Principles: Costs must be allowable, allocable and reasonable in accordance with the applicable Federal cost principles referenced in 10 CFR 600. The cost principles for commercial organization are in FAR Part 31.

Pre-award Costs: Recipients may charge to an award resulting from this announcement 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 10 CFR 600 and 2 CFR 215. Recipients must obtain the prior approval of the contracting officer for any pre-award costs that are for periods greater than this 90 day calendar period.

Pre-award costs are incurred at the applicant's risk. DOE is under no obligation to reimburse such costs if for any reason the applicant does not receive an award or if the award is made for a lesser amount than the applicant expected.

H. OTHER SUBMISSION AND REGISTRATION REQUIREMENTS

1. Where to Submit

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

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

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

2. Registration Process

ONE-TIME REGISTRATION PROCESS

You must complete the one-time registration process (all steps) before you can submit your first application through Grants.gov (See http://www.grants.gov/web/grants/applicants/grant-application-process.html). We recommend that you start this process at least six weeks before the application due date. It may take 44 days or more to complete the entire process. Use the Grants.gov Organizational Registration Checklists at http://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

3. Viewing Submitted Applications

Each Grants.gov application submitted to the DOE Office of Science (SC) automatically transfers into PAMS and is subsequently assigned to a program manager. At the time of program manager assignment, the three people listed on the SF-424 (R&R) cover page will receive an email with the subject line, “Receipt of Proposal 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 the Internet Explorer, Firefox, Google Chrome, or Safari browsers to access PAMS.

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

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

1. Log in to PAMS at https://pamspublic.science.energy.gov/.
2. Click the "Proposals" tab and click "Access Previously Submitted Grants.gov Proposal."
3. Enter the following information:
    - Proposal ID: Enter the ten-digit PAMS proposal ID, including the leading zeros (e.g., 00002xxxxx). Do not use the Grants.gov proposal number. Use the PAMS number previously sent to you in the email with subject line, "Receipt of Proposal …".
    - Email (as entered in Grants.gov 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)."
4. Click the "Save and Continue" button. You will be taken to your "My Proposals" page. The Grants.gov proposal will now appear in your list of proposals. Click the "Actions/Views" link in the options column next to this proposal to obtain a dropdown list. Select "Proposal" from the dropdown to see the proposal. Note that the steps above will work only for proposals submitted to the DOE Office of Science since May 2012.

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

1. To register, click the "Create New PAMS Account" link on the website https://pamspublic.science.energy.gov/.
2. Click the "No, I have never had an account" link and then the "Create Account" button.
3. You will be prompted to enter your name and email address, create a username and password, and select a security question and answer. Once you have done this, click the "Save and Continue" button.
4. On the next page, enter the required information (at least one phone number and your mailing address) and any optional information you wish to provide (e.g., FAX number, website, mailstop code, additional email addresses or phone numbers, Division/Department). Click the "Create Account" button.
5. Read the user agreement and click the "Accept" button to indicate that you understand your responsibilities and agree to comply with the rules of behavior for PAMS.
6. You will be taken to the Register to Institution page. Select the link labeled, "Option 1: My institution has submitted a proposal in Grants.gov. I am here to register as an SRO, PI, or

POC (Sponsored Research Officer, Principal Investigator, or Point of Contact)."

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

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

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

For help with PAMS, click the "External User Guide" link on the PAMS website, https://pamspublic.science.energy.gov/. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9 AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, Email: sc.pams-helpdesk@science.doe.gov. All submission and inquiries about this Funding Opportunity Announcement should reference **DE-FOA-0001142.**

Section V - APPLICATION REVIEW INFORMATION

A. CRITERIA

1. Initial Review Criteria

Full proposals that are submitted without a Letter of Intent having been previously submitted by the LOI deadline of **July 3, 2014, at 5 PM Eastern Time** will be declined without review.

Full proposals that do not receive an "encourage" response from the DOE will be declined without review.

Full proposals submitted after the full proposal deadline of **September 4, 2014, at 11:59 PM Eastern Time** will be declined without review.

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

Applications that fail to pass the initial review will not be forwarded for merit review and will be eliminated from further consideration.

2. Merit Review 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.

Merit reviewers will be asked to evaluate stewardship proposals based on an additional criterion:

- Quality of the Accelerator R&D Stewardship Opportunity.

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:

SCIENTIFIC AND/OR TECHNICAL MERIT OF THE PROPOSED RESEARCH

- What is the scientific and/or technical innovation of the proposed effort?
- How does the proposed work compare with other efforts in its field, both in terms of scientific and/or technical merit and originality?
- How might the results of the proposed work impact the direction, progress, and thinking in relevant fields of research?
- What is the likelihood of achieving influential results?
- Does the proposed work have the potential to significantly impact the Stewardship use described by the PI?
- Does the proposed work have synergy with the HEP mission?

APPROPRIATENESS OF THE PROPOSED METHOD OR APPROACH

- For Track 1 proposals:
    - Does the plan clearly describe the current technology state, and the technical gaps that must be addressed, to realize the application?
    - Does the proposal clearly describe specific technical milestones that can be used to evaluate the progress of the R&D?
    - Does the Program Plan and Risk Assessment correctly identify the primary risks, and appropriate mitigations for each?
    - If intellectual property protection is required, has a clear plan been spelled out?
    - If the application will result in a commercial product, has the market opportunity been clearly assessed and described? How good is the market opportunity?

- For Track 2 proposals:
    - Does the proposed effort employ innovative concepts or methods?
    - How logical and feasible are the approaches?
    - Are the conceptual framework, methods, and analyses well justified, adequately developed, and likely to lead to scientifically valid conclusions?
    - Does the applicant recognize significant potential problems and consider alternative strategies?

COMPETENCY OF APPLICANT'S PERSONNEL AND ADEQUACY OF PROPOSED RESOURCES

- Does the proposed work take advantage of unique facilities and capabilities?
- What is the past performance of the leading members of the collaboration?
- Are any proposed plans for recruiting any additional scientific and/or technical personnel including new senior staff, students and postdocs reasonable, justified, and appropriate?
- Are the environment and facilities adequate for performing the proposed effort?
- Are the senior investigator(s) or any members of the research group that are being reviewed

leaders within the proposed effort(s) and/or potential future leaders in the field?

- For Track 1 proposals:
  - Does the Teaming and Management Plan clearly define the roles and responsibilities of all key participants?
  - Does the collaborative team have an appropriate balance of accelerator-technology-side experts and application-side experts?
  - If the application will result in a commercial product, does the team include an appropriate industrial partner?
- For Track 2 proposals:
  - No additional questions.

REASONABLENESS AND APPROPRIATENESS OF THE PROPOSED BUDGET

- Are the proposed budget and staffing levels adequate to carry out the proposed work?
- Are all travel, student costs, and other ancillary expenses adequately estimated and justified?
- Is the budget reasonable and appropriate for the scope?

AS INDICATED ABOVE, THE FOLLOWING QUESTIONS ARE ALSO PROVIDED TO MERIT REVIEWERS WHEN EVALUATING THE ADDITIONAL CRITERION:

QUALITY OF THE ACCELERATOR R&D STEWARDSHIP OPPORTUNITY

In the questions that follow, the term "Stewardship customer" is used broadly to refer to the entity (other than HEP) whose mission or research objectives encompass the proposed work. The Stewardship customer can be another Office of Science (e.g., BES, NP, FES), another DOE program office (e.g., NNSA, EERE, ARPA-E) another federal agency (e.g., NIH, DoD), or industries that use accelerator technology.

- Does the proposed work require significant scientific or technical advances in accelerators or accelerator-related technology? (Accelerator-related technology includes such things as: superconducting magnets and RF cavities, RF and magnet power systems, specialized laser systems, specialized diagnostics and controls, and so on.)
- Will the proposed work result in substantial impact on the Stewardship customer's needs **and** result in some synergy with the HEP mission? (synergies might include: developing additional expertise or facilities relevant to present or future HEP-supported work).
- For the primary participating institution(s), is the activity reasonably consistent with the institution's primary mission? (e.g., if a National Laboratory is involved, is the activity consistent with that Laboratory's primary mission?)
- Is the PI/collaboration arguably the best performer/provider for the Stewardship activity? Are other entities capable of providing a substantially similar (or superior) capability?
- What evidence is there that the Stewardship customer endorses the goal? Does this proposal address issues that have been identified in writing (e.g., advisory committee reports, workshop reports, white papers, roadmaps) by the Stewardship customer? Does the Stewardship customer participate substantially and materially in this effort (e.g., by co-funding, cost-sharing, in-kind donation or equipment, donation of effort)?

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. Selection

The Selection Officials will consider merit review recommendations as well as program policy factors, such as ensuring a programmatically appropriate balance within the program areas, and quality of previous performance. The selection process will include contacting cognizant program officials at other federal agencies to request input on the value of proposed Stewardship activities. Selection of applications for award will be based upon the findings of the technical evaluations, the importance and relevance of the proposed research to the SC mission and/or other federal agencies, and funding availability.

3. Discussions and Award

The Government may enter into discussions with a selected applicant for any reason deemed necessary, including but not limited to: (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 10 CFR 600 and 10 CFR 605; and/or (4) special terms and conditions are required. Failure to resolve satisfactorily the issues identified by the Government will preclude award to the applicant.

C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES

DOE is striving to make awards within six months of the receipt of applications. It is anticipated that selections will be completed in the winter of 2014 and that awards will be made during the spring of 2015.

Section VI - AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES

1. Notice of Selection

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

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

2. Notice of Award

An Assistance Agreement issued by the contracting officer is the authorizing award document. It normally includes either as an attachment or by reference: (1) Special Terms and Conditions; (2) Applicable program regulations, if any; (3) Application as approved by DOE; (4) DOE assistance regulations at 10 CFR 600, or, for Federal Demonstration Partnership (FDP) institutions, the FDP terms and conditions; (5) National Policy Assurances To Be Incorporated As Award Terms; (6) Budget Summary; and (7) Federal Assistance Reporting Checklist, which identifies the reporting requirements.

B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

1. Administrative Requirements

The administrative requirements for DOE grants and cooperative agreements are contained in 10 CFR 600 and 10 CFR 605. Grants and cooperative agreements made to universities, non-profits and other entities subject to 2 CFR 215 are subject to the Research Terms and Conditions located on the National Science Foundation web site at http://www.nsf.gov/bfa/dias/policy/rtc/index.jsp .

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://www.nsf.gov/bfa/dias/policy/rtc/appc.pdf and at http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms under Award Terms.

4. Additional Conditions

CONFERENCE SPENDING (MARCH 2014)

The recipient shall not expend funds for the purpose of defraying the cost to the United States Government of a conference held by any Executive branch department, agency, board, commission, or office funded by FY2013 or future year appropriations for which the cost to the United States Government was more than $20,000, or 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 that is not directly and programmatically related to the purpose for which the grant or cooperative agreement was awarded.

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.

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. DOE cannot answer these questions.

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

For help with PAMS, click the "External User Guide" link on the PAMS website, https://pamspublic.science.energy.gov/. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, Email: sc.pams-helpdesk@science.doe.gov. All submission and inquiries about this Funding Opportunity Announcement should reference **DE-FOA-0001142.**

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) support@grants.gov
PAMS Customer Support	855-818-1846 (toll-free) 301-903-9610 sc.pams-helpdesk@science.doe.gov
Program Manager Scientific Contact	SC.HEPFOA@science.doe.gov Eric Colby 301-903-5475 Eric.colby@science.doe.gov

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

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

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 and non-disclosure agreements 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/patents-licensing-and-patent-waivers.

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.

Section IX - APPENDICES/REFERENCE MATERIAL

Glossary of Useful Grants and Cooperative Agreement terms

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

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

	or actual conflicts of interest, grantees and consultants must establish written guidelines indicating the conditions of payment of consulting fees. Consultants also include firms that provide professional advice or services.
continuation application/award	A financial assistance request (in the form of an application or progress report) or resulting award for a subsequent budget period within a previously approved project period for which a recipient does not have to compete with other applicants.
contract	An award instrument used to acquire from a non-federal party, by purchase, lease, or barter, property or services for the direct benefit or use of the Federal government. The same term may be used to describe a vendor relationship between a recipient and another party under a grant (to acquire routine goods and services); however, the recipient may use subaward to describe the contract under a grant relationship.
Contract (or Grants Management) Officer	A DOE official responsible for the business management aspects of grants and cooperative agreements, including review, negotiation, award, and administration, and for the interpretation of grants administration policies and provisions. COs and GMOs are delegated the authority to obligate DOE to the expenditure of funds and permit changes to approved projects on behalf of DOE.
Contract (or Grants Management) Specialist	A DOE staff member who works with a contract or grants management officer and is assigned the day-to-day management of a portfolio of grants and/or cooperative agreements. These activities include, but are not limited to, evaluating grant applications for administrative content and compliance with statutes, regulations, and guidelines; negotiating grants; providing consultation and technical assistance to grantees; and administering grants after award.
cooperative agreement	A type of financial assistance used when there will be substantial Federal scientific or programmatic involvement. Substantial involvement means that, after award, scientific or program staff will assist, guide, coordinate, or participate in project activities.
cost principles	The government-wide principles, issued by OMB (or, in the case of commercial organizations, the Federal Acquisition Regulation [48 CFR 21], or, in the case of hospitals, 45 CFR 74, Appendix E, "Principles For Determining Costs Applicable to Research and Development Under Grants and Contracts with Hospitals"), on allowability and unallowability of costs under federally sponsored agreements.
cost sharing	The portion of the costs of a project or program not borne by the sponsor; these could be grantee contributions or third-party in-kind contributions; costs used to satisfy cost sharing requirements are subject to the same policies governing allowability as other costs of the project. Research grants are generally not subject to cost sharing requirements. Also known as matching.
deadline	The published date and/or time that a grant application is to be either postmarked/mailed or electronically submitted to the funding agency.
debarment and suspension	The actions taken by a debarring official in accordance with OMB guidance at 2 CFR 180, "Non-procurement Debarment and Suspension," to exclude a person or organization from participating in grants and other non-procurement awards government-wide. If debarred or suspended, the person or organization may not receive financial assistance (under a grant, cooperative agreement, or subaward, or contract under a grant) for a specified period of time. Debarments and suspensions carried out pursuant to 2 CFR 376 are distinct from post-award suspension action by an awarding agency.
direct costs	Costs that can be identified specifically with a particular sponsored project, an instructional activity, or any other institutional activity, or that can be directly assigned

	to such activities relatively easily with a high degree of accuracy.
disallowance	A charge to a grant that the Federal awarding agency determines to be unallowable in accordance with the applicable Federal cost principles or other terms and conditions contained in the award.
domestic organization	A public (including a State or other governmental agency) or private non-profit or for-profit organization that is located in the United States or its territories, is subject to U.S. laws, and assumes legal and financial accountability for awarded funds and for the performance of the grant-supported activities.
DUNS number	A nine-digit number established and assigned by Dun and Bradstreet to uniquely identify a business entity.
effort	The amount of time, usually expressed as a percentage of the total, which a faculty member or other employee spends on a sponsored project. No one is allowed to spend more than 100% total commitment on all academic activities, including grant-sponsored research, university-sponsored research, teaching, administration, advising and other contracted duties. Effort is indicated on the budget in units of person-months.
equipment	An article of tangible nonexpendable personal property that has a useful life of more than 1 year and an acquisition cost per unit that equals or exceeds $5,000 or the capitalization threshold established by the organization, whichever is less.
expanded authorities	Authorization to grantees under certain research grant mechanisms which waives the requirement for prior agency approval for specified actions related to awards. Example: 90-day pre-award spending authority, no cost extensions for up to one additional year, and automatic carryover of unobligated funds from one budget period to the next. The expanded authorities are now contained in the standard terms and conditions for most research grants.
expiration date	Generally, the date signifying the end of the current project period, after which the grantee is not authorized to obligate grant funds.
facilities and administrative costs	Costs that are incurred by a grantee for common or joint objectives and that, therefore, cannot be identified specifically with a particular project or program. These costs also are known as indirect costs.
Federal Financial Report	Submitted on Standard Form (SF) 425, to indicate the status of awarded funds for the period covered. Frequency of reporting is specified in the Reporting Checklist provided as part of the Notice of Financial Assistance Agreement. Replaces the SF-269 Financial Status Report (FSR)
financial assistance	Transfer by DOE of money or property to an eligible entity to support or stimulate a public purpose authorized by statute.
Financial Status Report	See Federal Financial Report.
foreign travel	Foreign travel includes travel outside of the United States and its territories and possessions (Guam, American Samoa, Puerto Rico, the Virgin Islands, and the Canal Zone) and Canada. A trip is considered foreign travel for all legs of the itinerary if the traveler does not return to his or her post prior to departure for a foreign destination. Costs for foreign travel may be restricted by the language of a Funding Opportunity Announcement.
funding opportunity announcement	A publicly available document by which a Federal agency makes known its intentions to award discretionary grants or cooperative agreements, usually as a result of

	competition for funds. Funding Opportunity Announcements (FOA) may be known as program announcements, requests for applications, notices of funding availability, solicitations, or other names depending on the Agency and type of program. Funding opportunity announcements can be found at Grants.gov/FIND. A FOA may also be known as a solicitation.
grant	A financial assistance mechanism providing money, property, or both to an eligible entity to carry out an approved project or activity. A grant is used whenever DOE anticipates no substantial programmatic involvement with the recipient during performance of the financially assisted activities.
grant-supported project or activity	Those activities specified or described in a grant application or in a subsequent submission that are approved by DOE for funding, regardless of whether Federal funding constitutes all or only a portion of the financial support necessary to carry them out.
grantee	The organization or individual awarded a grant or cooperative agreement by DOE that is responsible and accountable for the use of the funds provided and for the performance of the grant-supported project or activity. The grantee is the entire legal entity even if a particular component is designated in Notice of Financial Assistance Agreement. The grantee is legally responsible and accountable to DOE for the performance and financial aspects of the grant-supported project or activity. Also known as awardee or recipient.
Grants.gov	Grants.gov (http://www.grants.gov/) has been designated by the Office of Management and Budget as the single access point for all grant programs offered by 26 Federal grant-making agencies. It provides a single interface for agencies to announce their grant opportunities and for all applicants to find and apply for those opportunities.
indirect costs	See facilities and administrative costs definition.
institutional base salary	The annual compensation paid by an organization for an employee's appointment, whether that individual's time is spent on research, teaching, patient care, or other activities. Base salary excludes any income that an individual may be permitted to earn outside of duties for the applicant/grantee organization. Base salary may not be increased as a result of replacing organizational salary funds with grant funds.
matching or cost sharing	The value of third-party in-kind contributions and the portion of the costs of a federally assisted project or program not borne by the Federal government. Matching or cost sharing may be required by statute or program regulation. Costs used to satisfy matching or cost-sharing requirements are subject to the same policies governing allowability as other costs under the approved budget.
merit (or peer) review	The process that involves the consistent application of standards and procedures that produce fair, equitable, and objective examinations of applications based on an evaluation of scientific or technical merit or other relevant aspects of the application. The review is performed by experts (reviewers) in the field of endeavor for which support is requested. Merit review is intended to provide guidance and to the DOE individuals responsible for making award decisions.
monitoring	A process whereby the programmatic and business management performance aspects of a grant are assessed by reviewing information gathered from various required reports, audits, site visits, and other sources.
no-cost extension	An extension of time to a project period and/or budget period to complete the work of the grant under that period, without additional Federal funds or competition.
non-Federal share	When cost sharing or matching is required as a condition of an award, the portion of

	allowable project/program costs not borne by the Federal government.
Notice of Financial Assistance Award	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. Also commonly referred to as an Assistance Agreement.
obligations	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.
OMB Circulars	Government-wide guidance issued to Heads of Federal agencies by the Director of the Office of Management and Budget (OMB). OMB Circulars directly pertinent to grants include the following: • cost principles (OMB Circular A-21, OMB Circular A-87, and OMB Circular A-122); • uniform administrative requirements (OMB Circular A-102 and OMB Circular A-110); • audit requirements for non-profit organizations (OMB Circular A-133). 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.
Other Significant Contributors	Individuals who have committed to contribute to the scientific development or execution of the project, but are not committing any specified measurable effort (i.e., person months) to the project. These individuals are typically presented at "effort of zero person months" or "as needed." Individuals with measurable effort may not be listed as Other Significant Contributors (OSCs). Consultants should be included if they meet this definition.
participant	Program participants are the recipients of service or training provided at a workshop, conference, seminar, symposium or other short-term instructional or information-sharing activity funded by an external grant or award, or the training beneficiaries of the project or program funded by an external grant or award. A participant is not involved in providing any deliverable to the grantee or a third party or would not be terminated or replaced for failure to perform.
participant costs	Costs used to pay program participants small stipends and reimbursement of travel costs or other out-of-pocket costs incurred to support attendance at a workshop, conference, seminar, symposium, or other short-term training or information-sharing activity.
person months	The metric for expressing the effort (amount of time) PD/PI(s), faculty and other senior/key personnel devote to a specific project. The effort is based on the type of appointment of the individual with the organization; e.g., calendar year, academic year, and/or summer term; and the organization's definition of such. For instance, some institutions define the academic year as a 9-month appointment while others define it as a 10-month appointment.

pre-application or pre-proposal

A brief outline or narrative of proposed work and sometimes budget, for informal review by a sponsor to determine whether a full proposal should be submitted. Three predominant reasons for requiring submission of a preliminary proposal are:

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

pre-award costs

Any cost incurred prior to the beginning date of the project period or the initial budget period of a competitive segment (under a multi-year award), in anticipation of the award and at the applicant's own risk, for otherwise allowable costs.

prior approval

Written approval from the designated Contracting Officer required for specified post-award changes in the approved project or budget. Such approval must be obtained before undertaking the proposed activity or spending DOE funds

Program Director/ Principal Investigator

The individual(s) designated by the applicant organization to have the appropriate level of authority and responsibility to direct the project or program to be supported by the award. The applicant organization may designate multiple individuals as program directors/principal investigators (PD/PIs) who share the authority and responsibility for leading and directing the project, intellectually and logistically. When multiple PD/PIs are named, each is responsible and accountable to the applicant organization, or as appropriate, to a collaborating organization for the proper conduct of the project or program including the submission of all required reports. The presence of more than one PD/PI on an application or award diminishes neither the responsibility nor the accountability of any individual PD/PI.

program income

Program income is gross income earned by a research grant recipient from the activities, part or all of which are borne as a direct cost by the grant. Examples are fees for services performed under the grant, rental or usage fees charged for use of equipment purchased with grant funds, third party patient reimbursements for hospital or medical services paid from the grant, funds generated by the sale of commodities, such as cell lines or research animals developed from or paid for from the grant, and patent or copyright royalties.

Program Manager

The DOE official responsible for the programmatic, scientific, and/or technical aspects of a grant. The same role is filled by Program Directors, Program Officers, or Project Directors at other Federal agencies.

progress report

Periodic, frequently annual, report submitted by the grantee and used by DOE to assess progress and to determine whether to provide funding for the budget period subsequent to that covered by the report.

project/performance site

Location(s) of where the work described in the research plan will be conducted.

project period

The total time for which Federal support of a project has been programmatically approved as shown in the Notice of Financial Assistance Agreement; however, it does not constitute a commitment by the Federal government to fund the entire period. The total project period comprises the initial competitive segment, any subsequent competitive segments resulting from a renewal award(s), and extensions.

proposal	See application.
re-budgeting	Reallocation of funds available for spending between budget categories to allow best use of funds to accomplish the project goals.
recipient	The organizational entity or individual receiving a grant or cooperative agreement.
renewal application	An application requesting additional funding for a period subsequent to that provided by a current award. Renewal applications compete for funds with all other peer reviewed applications and must be developed as fully as though the applicant is applying for the first time.
research	A systematic, intensive study intended to increase knowledge or understanding of the subject studied, a systematic study specifically directed toward applying new knowledge to meet a recognized need, or a systematic application of knowledge to the production of useful materials, devices, and systems or methods, including design, development, and improvement of prototypes and new processes to meet specific requirements. Also termed "research and development."
research misconduct	Fabrication, falsification, plagiarism, or other practices that seriously deviate from those that are commonly accepted within the scientific community in proposing, performing, or reporting research, or in reporting research results; does not include honest error or honest differences in interpretations or judgments of data.
SAM.gov	The System for Award Management (SAM) is the Government-wide system that consolidated the Central Contractor Registration (CCR), the Excluded Parties List System (EPLS), the Online Representations and Certifications Application (ORCA), and the Federal Agency Registration (FedReg).
scope of work	The aims, objectives, and purposes of a grant; as well as the methodology, approach, analyses or other activities; and the tools, technologies, and timeframes needed to meet the grant's objectives. This includes the research or training plan included with the original grant application, along with any approved modifications.
Senior/Key Personnel	The PD/PI and other individuals who contribute to the scientific development or execution of a project in a substantive, measurable way, whether or not they receive salaries or compensation under the grant. Typically these individuals have doctoral or other professional degrees, although individuals at the masters or baccalaureate level may be considered senior/key personnel if their involvement meets this definition. Consultants and those with a postdoctoral role also may be considered senior/key personnel if they meet this definition. "Zero percent" effort or "as needed" is not an acceptable level of involvement for Senior/Key Personnel.
significant rebudgeting	A threshold that is reached when expenditures in a single direct cost budget category deviate (increase or decrease) from the categorical commitment level established for the budget period by more than 25 percent of the total costs awarded. Significant rebudgeting is one indicator of change in scope.
small business concern	A business that is independently owned and operated and not dominant in its field of operation; has its principal place of business in the United States and is organized for profit; is at least 51 percent owned, or in the case of a publicly owned business, at least 51 percent of its voting stock is owned by U.S. citizens or lawfully admitted permanent resident aliens; has, including its affiliates, not more than 500 employees; and meets other regulatory requirements established by the SBA at 13 CFR 121.
solicitation	See Funding Opportunity Announcement

Stewardship customer	An entity (other than High Energy Physics) whose mission or research objectives encompass the proposed work. The Stewardship customer can be another Office of Science (e.g. BES, NP, FES, etc.), another DOE program office (e.g. NNSA, EERE, etc.) another federal agency (e.g. NIH, DoD, etc.), or a private industry that uses accelerator technology.
subaward	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.
subrecipient	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.
supplement	A request for an increase in support during a current budget period for expansion of the project's scope or to meet increased costs unforeseen at the time of the new or renewal application. A supplement may increase support for future years in addition to the current year. Supplements require applications and are subject to administrative and merit review.
terms and conditions of award	All legal requirements imposed on a grant by DOE, whether based on statute, regulation, policy, or other document referenced in the grant award, or specified by the grant award document itself. The Notice of Financial Assistance Agreement 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.
unallowable costs	Specific categories of costs that cannot be charged, directly or indirectly, to federally sponsored agreements in accordance with federal regulations.
unliquidated obligation	For reports prepared on a cash basis, the amount of obligations incurred by the recipient that has not been paid; or For reports prepared on an accrued expenditure basis, the amount of obligations incurred by the recipient for which an outlay has not been recorded.
unobligated balance	The portion of the funds authorized by the Federal agency for expenditure by the recipient that has not been obligated by the recipient.