FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT

U.S. Department of Energy
Office of Science

Continuation of Solicitation for the Office of Science Financial Assistance Program

Funding Opportunity Number: DE-PS02-09ER09-01
Announcement Type: Initial
CFDA Number: 81.049

Issue Date:	**10/1/2008**
Letter of Intent Due Date:	**Not Applicable**
Pre-Application Due Date:	**Not Applicable**
Application Due Date:	**Not Applicable** This announcement will remain open until {September 30, 2009} or until replaced by a successor announcement. Applications may be submitted any time during this period.
Program Manager Contact:	Questions regarding the program (technical) requirements must be directed to the DOE Program Manager for your grant.

This notice will be published annually and will remain in effect until it is succeeded by another issuance by the Office of Science, usually published after the beginning of the fiscal year (October 1, 2009).

This annual Notice DE-PS02-09ER09-01, published March 5, 2009, has been edited to address the change in the forms package from PureEdge to Adobe and succeeds Notice DE-PS02-09ER09-01, originally published October 1, 2008.

Note that Grants.gov requires Applicants to use the compatible version of Adobe Reader software to complete a Grants.gov Adobe application package. To ensure you have the Grants.gov compatible version of Adobe Reader, visit the download software page at http://www.grants.gov/help/download_software.jsp "

NOTE: REQUIREMENTS FOR GRANTS.GOV

Where to Submit: 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 CCR 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.

Registration Requirements: There are several one-time actions you must complete in order to submit an application through Grants.gov (e.g., obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number, register with the Central Contract Registry (CCR), register with the credential provider, and register with Grants.gov). See http://www.grants.gov/GetStarted. Use the Grants.gov Organization Registration Checklist at http://www.grants.gov/assets/OrganizationRegCheck.doc to guide you through the process. Designating an E-Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in the CCR registration process. Applicants, who are not registered with CCR and Grants.gov, should allow at least 21 days to complete these requirements. It is suggested that the process be started as soon as possible.

IMPORTANT NOTICE TO POTENTIAL APPLICANTS: 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).

MICROSOFT VISTA AND OFFICE 2007 COMPATIBILITY: Grants.gov is currently incompatible with both the new Microsoft (MS) Vista Operating System and the new Microsoft (MS) Office 2007 versions of Word, Excel and Power Point. In order to create and submit your application to Grants.gov, you must find a computer with a previous version of the Microsoft Operating System, such as Windows XP.

If you attach a file created using MS Office 2007, you will not get an error message when you submit the application, HOWEVER your entire application will not be able to be processed or accepted at Grants.gov and will not reach DOE. Grants.gov can accept applications with attachments created in MS Office 2007 if the attachments are saved in the prior format. See www.grants.gov/www.grants.gov/assets/Vista_and_office_07_Compatibility.pdf for detailed

instructions on how to do this. A file created in MS Office 2007 can be identified by the "x" at the end of the file extension, for example "sample.docx" for a Word file. Contact Grants.gov at 1-800-518-4726 with any questions.

Questions: Questions relating to the 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. Part VII of this announcement explains how to submit other questions to the Department of Energy.

Application Receipt Notices: After an application is submitted, the Authorized Organization Representative (AOR) will receive a series of five e-mails. It is extremely important that the AOR watch for and save each of the e-mails. It may take up to two (2) business days from application submission to receipt of e-mail Number 2. When the AOR receives e-mail Number 5, it is their responsibility to follow the instructions in the e-mail to logon to IIPS and verify that their application was received by DOE. The titles of the five 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
Number 5 – DOE e-Center Grant Application Received

The last e-mail will contain instructions for the AOR to register with the DOE e-Center. If the AOR is already registered with the DOE e-Center, the title of the last e-mail changes to:

Number 5 – DOE e-Center Grant Application Received and Matched

This e-mail will contain the direct link to the application in IIPS. The AOR will need to enter their DOE e-Center user id and password to access the application.

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PART I – FUNDING OPPORTUNITY DESCRIPTION

GENERAL INQUIRIES ABOUT THIS FOA SHOULD BE DIRECTED TO:

Program Manager Contact: Questions regarding the specific program areas/technical requirements should be directed to the points of contact listed for each program office within the Notice and not to the Notice Administrative Contact.

If you experience problems when submitting your application to Grants.gov, please visit their customer support website: http://www.grants.gov/CustomerSupport; email: support@grants.gov; or call 1-800-518-4726.

SUMMARY: The Office of Science of the Department of Energy hereby announces its continuing interest in receiving grant applications for support of work in the following program areas: Basic Energy Sciences, High Energy Physics, Nuclear Physics, Advanced Scientific Computing, Fusion Energy Sciences, Biological and Environmental Research, and Workforce Development for Teachers and Scientists. On September 3, 1992, DOE published in the Federal Register the Office of Energy Research Financial Assistance Program (now called the Office of Science Financial Assistance Program), 10 CFR Part 605, Final Rule, which contained a solicitation for this program. Information about submission of applications, eligibility, limitations, evaluation and selection processes and other policies and procedures are specified in 10 CFR Part 605.

This announcement will remain open until September 30, 2009, 8:00 PM Eastern Time, or until it is succeeded by another issuance, whichever occurs first. This annual Notice DE-PS02-09ER09-01 succeeds Notice DE-PS02-08ER08-01, which was published October 1, 2007.

It is anticipated that approximately $400 million will be available for grant and cooperative agreement awards in FY 2009. The DOE is under no obligation to pay for any costs associated with the 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 Notice.

The following program descriptions are offered to provide more in-depth information on scientific and technical areas of interest to the Office of Science.

1. Basic Energy Sciences

The mission of the Basic Energy Sciences (BES) program—a multipurpose, scientific research effort—is to foster and support fundamental research to expand the scientific foundations for new and improved energy technologies and for understanding and mitigating the environmental impacts of energy use. The portfolio supports work in the natural sciences by emphasizing fundamental research in materials sciences, chemistry, geosciences, and physical biosciences.

The four long-term goals in scientific advancement that the BES program is committed to and against which progress can be measured are:

- Design, model, fabricate, characterize, analyze, assemble, and use a variety of new materials and structures, including metals, alloys, ceramics, polymers, biomaterials and more—particularly at the nanoscale—for energy-related applications.

- Understand, model, and control chemical reactivity and energy transfer processes in the gas phase, in solutions, at interfaces, and on surfaces for energy-related applications, employing lessons from inorganic and biological systems.

- Develop new concepts and improve existing methods to assure a secure energy future, e.g., for solar energy conversion and for other energy sources.

- Conceive, design, fabricate, and use new scientific instruments to characterize and ultimately control materials, especially instruments for x-ray, neutron, and electron beam scattering and for use with high magnetic and electric fields.

Program Website: http://www.science.doe.gov/bes/bes.html

The BES science subprograms and their objectives are as follows:

(a) Materials Sciences and Engineering

The objective of this subprogram is to support fundamental experimental and theoretical research to provide the knowledge base for the discovery and design of new materials with novel structures, functions, and properties. These research activities emphasize the design and synthesis of materials; the characterization of their structure and defect state; the understanding of their physical, chemical, and irradiation-induced behaviors over multiple length and time scales; and the development and advancement of new experimental and computational tools and techniques. The main research elements of the subprogram are condensed matter and materials physics; scattering and instrumentation sciences; and materials discovery, design, and synthesis.

In condensed matter and materials physics – including activities in experimental condensed matter physics, theoretical condensed matter physics, mechanical behavior and radiation effects, and physical behavior of materials – research is supported to understand, design, and control materials properties and function. These goals are accomplished through studies of the relationship of materials structures to their electrical, optical, magnetic, surface reactivity, and mechanical properties and the way in which materials respond to external forces such as stress, chemical and electrochemical environments, radiation, and the proximity of materials to surfaces and interfaces. The activity emphasizes correlation effects, which can lead to the formation of new particles, new phases of matter, and unexpected phenomena. The theoretical efforts focus on the development of advanced computer algorithms and codes to treat large or complex systems.

In scattering and instrumentation sciences – including activities in neutron and x-ray scattering and electron and scanning microscopies – research is supported on the fundamental interactions of photons, neutrons, and electrons with matter to understand the atomic, electronic, and magnetic structures and excitations of materials and the relationship of these structures and excitations to materials properties and behavior. Major research areas include fundamental dynamics in complex materials, correlated electron systems, nanostructures, and the characterization of novel systems. The development of next-generation neutron, x-ray, and electron microscopy instrumentation is a key element of this portfolio.

In materials discovery, design, and synthesis – including activities in synthesis and processing science, materials chemistry, and biomolecular materials – research is supported in the discovery and design of novel materials and the development of innovative materials synthesis and processing methods. Major research thrust areas include nanoscale synthesis, organization of nanostructures into macroscopic structures, solid state chemistry, polymers and polymer composites, surface and interfacial chemistry including electrochemistry and electro-catalysis, and synthesis and processing science including biomimetic and bioinspired routes to functional materials and complex structures.

Program Contact: Phone (301) 903-3427

Website: http://www.science.doe.gov/bes/dms/DMSE.htm

(b) Chemical Sciences, Geosciences, and Biosciences

The objective of this subprogram is to support fundamental research enabling the understanding of chemical transformations and energy flow in systems relevant to DOE missions. This knowledge serves as a basis for the development of new processes for the generation, storage, and use of energy and for mitigation of the environmental impacts of energy use. New experimental techniques are developed to investigate chemical processes and energy transfer over a wide range of spatial and temporal scales: from atomic to kilometer spatial scales and from femtosecond to millennia time scales. Theory, modeling, and computational simulations are performed, from detailed quantum calculations of chemical properties and reactivity to multi-scale simulations of combustion devices. The main research activities within the subprogram are fundamental interactions; photo- and biochemistry; and chemical transformations.

In fundamental interactions, basic research is supported in atomic, molecular and optical sciences; gas-phase chemical physics; ultrafast chemical science; and condensed phase and interfacial molecular science. Emphasis is placed on structural and dynamical studies of atoms, molecules, and nanostructures, and the description of their interactions in full quantum detail, with the aim of providing a complete understanding of reactive chemistry in the gas phase, condensed phase, and at interfaces. Novel sources of photons, electrons, and ions are used to probe and control atomic, molecular, and nanoscale matter. Ultrafast optical and x-ray techniques are developed and used to study chemical dynamics. There is a focus on cooperative phenomena in complex chemical systems, such as the effect of solvation on chemical structure, reactivity, and transport and the coupling of complex gas-phase chemistry with turbulent flow in combustion.

In photo- and biochemistry, including solar photochemistry, photosynthetic systems, and physical biosciences, research is supported on the molecular mechanisms involved in the capture of light energy and its conversion into chemical and electrical energy through biological and chemical pathways. Natural photosynthetic systems are studied to create robust artificial and bio-hybrid systems that exhibit the biological traits of self assembly, regulation, and self repair. Complementary research encompasses organic and inorganic photochemistry, photo-induced electron and energy transfer, photoelectrochemistry, and molecular assemblies for artificial photosynthesis. Inorganic and organic photochemical studies provide information on new chromophores, donor-acceptor complexes, and multi-electron photocatalytic cycles. Photoelectrochemical conversion is explored in studies of nanostructured semiconductors at

liquid interfaces. Biological energy transduction systems are investigated, with an emphasis on the coupling of plant development and microbial biochemistry with the experimental and computational tools of the physical sciences.

In chemical transformations, the themes are characterization, control, and optimization of chemical transformations, including efforts in catalysis science; separations and analytical science; actinide chemistry; and geosciences. Catalysis science underpins the design of new catalytic methods for the clean and efficient production of fuels and chemicals and emphasizes inorganic and organic complexes; interfacial chemistry; nanostructured and supramolecular catalysts; photocatalysis and electrochemistry; and bio-inspired catalytic processes. Heavy element chemistry focuses on the spectroscopy, bonding, and reactivity of actinides and fission products; complementary research on chemical separations focuses on the use of nanoscale membranes and the development of novel metal-adduct complexes. Chemical analysis research emphasizes laser-based and ionization techniques for molecular detection, particularly the development of chemical imaging techniques. Geosciences research covers analytical and physical geochemistry, rock-fluid interactions, and flow/transport phenomena; this research provides a fundamental basis for understanding the environmental contaminant fate and transport and for predicting the performance of repositories for radioactive waste or carbon dioxide sequestration.

Program Contact: Phone (301) 903-2046

Website: http://www.science.doe.gov/bes/Division.htm#chemical

(c) Accelerator and Detector Research

The objective of this program is to improve the output and capabilities of synchrotron radiation light source and neutron scattering facilities that are the most advanced of their kind in the world. This program supports basic research in accelerator physics and x-ray and neutron detectors. Research is supported that seeks to achieve a fundamental understanding beyond the traditional accelerator science and technology in order to develop new concepts to be used in the design of new accelerator facilities for synchrotron radiation and spallation neutron sources. To exploit fully the fluxes delivered by synchrotron radiation facilities and spallation neutron sources, new detectors capable of acquiring data several orders of magnitude faster are required. Improved detectors are especially important in the study of multi-length scale systems such as protein-membrane interactions as well as nucleation and crystallization in nanophase materials. They will also enable real-time kinetic studies and studies of weak scattering samples. This program strongly interacts with BES programmatic research that uses synchrotron radiation and neutron sources.

Program Contact: Phone (301) 903-1873

Website: http://www.science.doe.gov/bes/User_Facilities/dsuf/DSUF.htm

(d) Experimental Program to Stimulate Competitive Research (EPSCoR)

The objective of the EPSCoR program is to enhance the capabilities of EPSCoR states to conduct nationally competitive energy-related research and to develop science and engineering manpower to meet current and future needs in energy-related fields. The program supports basic research spanning the broad range of science and technology programs within the DOE in states

that have historically received relatively less Federal research funding. The EPSCoR states are Alabama, Alaska, Arkansas, Delaware, Hawaii, Idaho, Iowa, Kansas, Kentucky, Louisiana, Maine, Mississippi, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Dakota, Oklahoma, Rhode Island, South Carolina, South Dakota, Tennessee, Utah, Vermont, West Virginia, and Wyoming, along with the Commonwealth of Puerto Rico and the U.S. Virgin Islands. The research supported by EPSCoR includes materials sciences, chemical sciences, physics, energy-relevant biological sciences, geological and environmental sciences, high energy physics, nuclear physics, fusion energy sciences, advanced computing, and the basic sciences underpinning fossil energy, nuclear energy, energy efficiency, and renewable energy. The core activity interfaces with all other core activities within the Office of Science. It is also responsive and supports the DOE mission in the areas of energy and national security and in mitigating their associated environmental impacts.

Program Contact: Phone (301) 903-9830

Website: http://www.science.doe.gov/bes/EPSCoR/index.htm

2. High Energy Physics

The primary objectives of the High Energy Physics (HEP) program are to explore the most elementary constituents of matter and energy and their fundamental interactions, including the unknown “dark” forms of matter and energy that appear to dominate the universe; to understand if fundamental forces may ultimately be unified; and to explore the basic nature of space and time itself.

In support of these broad scientific objectives, the HEP program has established specific long-term goals that correspond very roughly to current research priorities, and are representative of the program:

- Measure the properties and interactions of the heaviest known particle (the top quark) in order to understand its particular role in the Standard Model.
- Measure the matter-antimatter asymmetry in many particle decay modes with high precision.
- Discover or rule out the Standard Model Higgs particle, thought to be responsible for generating mass of elementary particles.
- Determine the pattern of the neutrino masses and the details of their mixing parameters.
- Confirm the existence of new supersymmetric (SUSY) particles, or rule out the minimal SUSY "Standard Model" of new physics.
- Directly discover, or rule out, new particles which could explain the cosmological "dark matter".

All grant proposals should address one or more of these goals, or else explain how the proposed research supports the broad scientific objectives outlined above.

There are two subprograms within the Office of High Energy Physics that support research and technology development aimed at these objectives.

(a) High Energy Physics Research

This research falls into two broad categories: experimental research and theoretical research.

The High Energy Physics Research subprogram supports research aimed at the long term scientific goals outlined above, with experiments utilizing man-made and naturally occurring particle sources, and theoretical studies that provide or extend the framework of understanding for HEP. This subprogram has also provided graduate and postdoctoral research training for HEP scientists in pursuit of these goals, and equipment for experiments and related computational efforts.

Topics studied in the experimental research program include, but are not limited to: proton-(anti)proton collisions at the highest possible energies; studies of neutrino properties using accelerator-produced neutrino beams as well as neutrinos from nuclear reactors; sensitive measurements of rarely occurring phenomena that can indicate new physics beyond the Standard Model; measurements of dark energy; and detection of the particles that make up cosmic dark matter. Topics studied in the theoretical research program include, but are not limited to: phenomenological and theoretical studies that support the experimental research program, both in understanding the data and in finding new directions for experimental exploration; developing analytical and numerical computational techniques for these studies; and to find theoretical frameworks for understanding fundamental particles and forces at the deepest level possible.

Program Contact: Phone (301) 903-4829

Website - http://www.science.doe.gov/hep/physics_research.shtm

(b) Advanced Technology Research and Development

This research falls into two broad categories: accelerator science and particle detector development. The goal of this subprogram is to enable forefront research and development in those aspects of accelerator and detector technology that have a strong potential to advance the capabilities of HEP research. The subprogram has also provided training for new scientists and had significant impact on other sciences, the economy, health, and other sectors.

The technology R&D subprogram supports long-range, exploratory research aimed at developing new concepts. Topics studied in the accelerator science program include, but are not limited to: analytic and computational techniques for modeling particle beams; novel acceleration concepts; muon colliders and neutrino factories; the science of high gradients in room-temperature accelerating cavities; high-brightness beam sources; and cutting-edge beam diagnostic techniques. Topics studied in the detector development program include, but are not limited to:

low-mass, high channel density charged particle tracking detectors; high resolution, fast-readout calorimeters and particle identification detectors; improving the radiation tolerance of particle detectors; and advanced electronics and data acquisition systems.

Program Contact: Phone (301) 903-5228

Website - http://www.science.doe.gov/hep/advanced_technology.shtm

3. Nuclear Physics

The Nuclear Physics program supports basic research, technical developments and world-class accelerator facilities to expand our fundamental understanding of the interactions and structures of atomic nuclei and nuclear matter, and an understanding of the forces of nature as manifested in nuclear matter. Today, the reach of nuclear physics extends from the quarks and gluons that form the substructure of the once-elementary protons and neutrons, to the most dramatic of cosmic events-supernovae. These and many other diverse activities are driven by five broad questions articulated recently by the Nuclear Science Advisory Committee (NSAC) in the Opportunities in Nuclear Science: A Long-Range Plan for the Next Decade. The four subprogram areas and their objectives are organized around answering these five key questions. Research activities supported by the Office of Nuclear Physics are aligned with and contribute to the overall progress of the following long term performance measures:

Make precision measurements of fundamental properties of the proton, neutron and simple nuclei for comparison with theoretical calculations to provide a quantitative understanding of their quark substructure.

Recreate brief, tiny samples of hot, dense nuclear matter to search for the quark-gluon plasma and characterize its properties.

Investigate new regions of nuclear structure, study interactions in nuclear matter like those occurring in neutron stars, and determine the reactions that created the nuclei of atomic elements inside stars and supernovae.

Measure fundamental properties of neutrinos and fundamental symmetries by using neutrinos from the sun and nuclear reactors and by using radioactive decay measurements.

Contribute to the theoretical understanding of any of the above.

The program is organized into the following four subprograms:

(a) Medium Energy Nuclear Physics

This subprogram supports experimental research primarily at the Thomas Jefferson National Accelerator Facility and with the polarized proton collision program at the Relativistic Heavy Ion Collider (RHIC-Spin), directed at answering the first key question: What is the structure of the nucleon? Detailed investigations of the structure of the nucleon are aimed at understanding how these basic building blocks of matter are constructed from the elementary quarks and gluons of Quantum Chromo-Dynamics (QCD) and how complex interactions among them generate all the properties of the nucleon, including its electromagnetic and spin properties. New knowledge in this area would also allow the nuclear binding force to be described in terms of QCD, thus providing a path for understanding the structure of atomic nuclei from first principles.

Program Contact: Dr. Brad Tippens (301) 903-3904

(b) Heavy Ion Nuclear Physics

This subprogram supports experimental research primarily at the Relativistic Heavy Ion Collider (RHIC) directed at answering the second question: What are the properties of hot nuclear matter? At extremely high temperatures, such as those that existed in the early universe immediately

after the "Big Bang," normal nuclear matter is believed to revert to its primeval state called the quark-gluon plasma. This research program aims to recreate extremely small and brief samples of this high energy density phase of matter in the laboratory by colliding heavy nuclei at relativistic energies. At much lower temperatures, nuclear matter passes through another phase transition from a Fermi liquid to a Fermi gas of free roaming nucleons; understanding this phase transition is also a goal of the subprogram.

Program Contact: Dr. Gulshan Rai (301) 903-4702

(c) Low Energy Nuclear Physics

This subprogram supports experimental research directed at understanding the remaining three questions: What is the structure of nucleonic matter? Forefront nuclear structure research lies in studies of nuclei at the limits of excitation energy, deformation, angular momentum, and isotopic stability. The properties of nuclei at these extremes are not known and such knowledge is needed to test and drive improvement in nuclear models and theories about the nuclear many-body system. What is the nuclear microphysics of the universe? Knowledge of the detailed nuclear structure, nuclear reaction rates, half-lives of specific nuclei, and the limits of nuclear existence at both the proton and neutron drip lines is crucial for understanding the nuclear astrophysics processes responsible for the production of the chemical elements in the universe, and the explosive dynamics of supernovae. Is there new physics beyond the Standard Model? Studies of fundamental interactions and symmetries, including those of neutrino oscillations, are indicating that our current "Standard Model" theory which explains what the universe is and what holds it together is incomplete, opening up possibilities for new discoveries by precision experiments.

Program Contact: Dr. Cyrus Baktash (301) 903-0258

(d) Nuclear Theory (including the Nuclear Data subprogram)

Progress in nuclear physics, as in any science, depends critically on improvements in the theoretical techniques and on new insights that will lead to new models and theories that can be applied to interpret experimental data and predict new behavior. The Nuclear Theory program supports theoretical research directed at understanding all five of the central questions identified in the NSAC 2002 Long Range Plan. Included in the theory program are the activities that are aimed at providing information services on critical nuclear data and have as a goal the compilation and dissemination of an accurate and complete nuclear data information base that is readily accessible and user oriented.

Program Contact: Dr. Gene Henry (301) 903-6093

4. Advanced Scientific Computing Research (ASCR)

The mission of the Advanced Scientific Computing Research Program is to deliver forefront computational and networking capabilities to enable scientists to extend the frontiers of science, answering critical questions that range from nanoscience to astrophysics and include nuclear structure, the function of living cells and the power of fusion energy. For example, two long term measures for the program are:

- Demonstrate progress toward developing the mathematics, algorithms, and software that enable effective scientifically critical models of complex systems, including highly nonlinear or uncertain phenomena, or processes that interact on vastly different scales or contain both discrete and continuous elements.

- Demonstrate progress toward developing, through the Genomes to Life partnership with the Biological and Environmental Research program, the computational science capability to model a complete microbe and a simple microbial community.

In order to accomplish this mission, the Advanced Scientific Computing Research program supports research in applied mathematics, computer science and networking. ASCR also operates Leadership Computing facilities, a high-performance production computing center, and a high-speed network to facilitate the analysis, modeling, simulation, and prediction of complex phenomena important to the Department of Energy.

The computing resources and the networks required to meet Office of Science needs exceed the state-of- the-art by a significant margin. Furthermore, the algorithms, software tools, the software libraries and the distributed software environments needed to accelerate scientific discovery through modeling and simulation are beyond the realm of commercial interest. To establish and maintain DOE's modeling and simulation leadership in scientific areas that are important to its mission, ASCR implements a broad base research portfolio in applied mathematics, computer science, and network research to underpin advances in mathematical methods, software tools, software libraries, software environments and networks needed to solve complex problems on computational resources that are on a trajectory to reach well beyond a petascale within a few years. Research areas of interest include:

(a) Applied Mathematics

Research on the mathematical methods and numerical algorithms that enable the effective description, understanding, and prediction of complex physical, biological, and human-engineered systems. For example, the subjects of supported research efforts may include: (1) numerical methods for the parallel solution of systems of partial differential equations, large-scale linear or nonlinear systems, or very large parameter-estimation problems; (2) analytical or numerical techniques for modeling complex physical or biological phenomena, such as fluid turbulence or microbial populations; (3) analytical or numerical methods for bridging a broad range of temporal and spatial scales; (4) optimization, control, and risk analysis of complex systems, such as computer networks and electrical power grids; and (5) mathematical research issues related to petascale science.

(b) Computer Science

Research in computer science to enable petascale scientific applications through advances in massively parallel computing such as scalable and fault tolerant operating systems, programming models, performance modeling and assessment tools, development tools, interoperability and infrastructure methodology, and large scale data management and visualization. The development of new computer and computational science techniques will allow scientists to use the most advanced computers without being overwhelmed by the complexity of rewriting their codes with each new generation of high performance architectures.

(c) Network Environment Research

Research to develop and deploy a high-performance network and collaborative technologies to support distributed high-end science applications and large-scale scientific collaborations. The current focus areas include but are not limited to cyber security systems, dynamic bandwidth allocation services, network measurement and analysis, ultra high-speed transport protocols, and advanced application layer services that make it easy for scientists to effectively and efficiently access and use distributed resources, such as advanced services for group collaboration, secure services for remote access of distributed resources, and innovative technologies for sharing, controlling, and managing distributed computing resources.

(d) Broadening Participation and Collaboration

Activities that develop innovative approaches for broadening and strengthening participation in applied mathematics, computer science, computational science and high performance computing.

Program Contact: (301) 903-5800

5. Fusion Energy Sciences

The Office of Fusion Energy Sciences (OFES) program supports the Department's Energy Security and World-Class Scientific Research Capacity goals. The OFES program goal is to advance plasma science, fusion science, and fusion technology -- the knowledge base needed for an economically and environmentally attractive fusion energy source. The OFES supports basic and applied research, encourages technical cross-fertilization with the broader U.S. science community, and uses international collaboration to accomplish this goal.

The OFES program contributes to the Energy Security goal through participation in ITER, an experiment to study and demonstrate the sustained burning of fusion fuel. ITER will provide an unparalleled scientific research opportunity and will test the scientific and technical feasibility of fusion power, will also be the penultimate step before a demonstration fusion power plant. The ITER negotiations were successfully completed in fiscal year (FY) 2006 and the ITER Agreement was signed and ratified by the ITER parties in FY 2008. Currently OFES scientists and engineers are supporting the design activities, technical R&D, hardware procurement and other construction activities.

The OFES program contributes to the World-Class Scientific Research Capacity goal by managing a program of fundamental research into the nature of fusion plasmas and the means for confining plasma to yield energy. This includes: 1) exploring basic issues in plasma science; 2) developing the scientific basis and computational tools to predict the behavior of magnetically confined plasmas; 3) using the advances in tokamak research to enhance the initiation of the burning plasma physics phase of the OFES program; 4) exploring innovative confinement options that offer the potential of more attractive fusion energy sources in the long term; 5) advancing our understanding of high energy density laboratory plasmas and exploring attractive pathways to attaining states of high energy density matter, (in collaboration with the Department of Energy (DOE) National Nuclear Security Administration); 6) developing the cutting edge technologies that enable fusion facilities to achieve their scientific goals; and 7) advancing the science base for innovative materials to establish the economic feasibility and environmental quality of fusion energy.

The overall effort requires operation of a set of unique and diversified experimental facilities, ranging from smaller-scale university experiments to large national facilities that involve extensive collaborations. These facilities provide scientists with the experimental data to validate theoretical understanding and computer models—leading ultimately to an improved predictive capability for fusion science. Scientists from the U.S. also participate in leading edge experiments on fusion facilities abroad and conduct comparative studies to supplement the scientific understanding they can obtain from domestic facilities.

Operation of the major fusion facilities will be focused on science issues relevant to ITER design and operation. The United States is an active participant in the International Tokamak Physics Activity, which facilitates identification of high priority research for burning plasmas in general, and for ITER specifically, through workshops and assigned tasks. In addition, there will be continuing efforts to investigate simulations of fusion plasmas in collaboration with the Office of Advanced Scientific Computing Research.

There are three measures that will be used to demonstrate that progress is being made towards meeting the overall program goal over the next ten years. These performance measures are:

1. Predictive Capability for Burning Plasmas: Develop a predictive capability for key aspects of burning plasmas using advances in theory and simulation benchmarked against a comprehensive experimental database of stability, transport, wave-particle interaction, and edge effects.

2. Configuration Optimization: Demonstrate enhanced fundamental understanding of magnetic confinement and improved basis for future burning plasma experiments through research on magnetic confinement configuration optimization.

3. High Energy Density Physics: Develop the fundamental understanding and predictability of high energy density plasmas for potential energy applications.

The Science and Facility Operations Subprograms

The Science subprogram seeks to develop the physics knowledge base needed to advance the OFES program. Research is conducted on small to large-scale confinement devices to study physics issues relevant to fusion and plasma physics and to the production of fusion energy. Experiments on these devices are used to explore the limits of specific confinement concepts, as well as study associated physical phenomena. Specific topics of interest to ITER include: (1) reducing plasma energy and particle transport at high densities and temperatures; (2) understanding the physical laws governing stability of high pressure plasmas; (3) investigating plasma wave interactions; (4) studying and controlling impurity particle transport and exhaust in plasmas; and (5) understanding the interaction and coupling among these four issues in a fusion experiment.

Research is also carried out in the following areas: (1) basic plasma science directed at furthering the understanding of fundamental processes in plasmas; (2) theory and modeling to provide the understanding of fusion plasmas necessary for interpreting results from present experiments, planning future experiments, and designing future confinement devices; (3) atomic physics and the development of new diagnostic techniques for support of confinement experiments; (4) innovative confinement concepts; and (5) high energy density laboratory plasmas and issues that

support the development of Inertial Fusion Energy Sciences (IFES). The high energy density physics necessary for IFE target development is carried out by the Office of Defense Programs in the DOE's National Nuclear Security Administration.

The Enabling R&D Subprogram

The Enabling R&D subprogram supports the advancement of fusion science in the nearer-term by carrying out research on technological topics that: (1) enable domestic experiments to achieve their full performance potential and scientific research goals; (2) permit scientific exploitation of the performance gains being sought from physics concept improvements; (3) allow the U.S. to enter into international collaborations gaining access to experimental conditions not available domestically; and (4) explore the science underlying these technological advances.

Research is also carried out in the following areas: (1) plasma facing components, (2) structural and special purpose materials, (3) heating and fueling technologies, (4) breeding blankets and fuel cycle and (5) safety and neutronics.

In addition, the Enabling R&D subprogram also supports pursuit of fusion energy science for the longer-term by conducting research aimed at innovative technologies, designs and materials to point toward an attractive fusion energy vision and affordable pathways for optimized fusion development.

Program Contact: (301) 903-4095

6. Biological and Environmental Research Program

For over 50 years the Biological and Environmental Research (BER) Program has been investing in the biological and environmental sciences related to energy production. The hallmark of BER programs is a systems science approach employing a range of disciplines to address DOE-relevant mission needs. A key element is BER's focus on scales, both spatial and temporal, ranging from the molecular to the global (Earth scale) and from the nanosecond to the century. This trans-disciplinary, multi-dimensional science moves beyond traditional single-disciplinary approaches, resulting in entirely new fields of research. BER science focuses "over–the-horizon," with broad and novel impacts on DOE's energy and environmental missions.

The BER program provides fundamental science to underpin the Department's strategic plan; specifically, Strategic Theme 3, Scientific Discovery & Innovation.

Strategic Goal 3.1, Scientific Breakthroughs: Achieve the major scientific discoveries that will drive U.S. competitiveness; inspire America; and revolutionize our approaches to the Nation's energy, national security, and environmental quality challenges.

Strategic Goal 3.2, Foundations of Science: Deliver the scientific facilities, train the next generation of scientists and engineers, and provide the laboratory infrastructure required for U.S. scientific primacy.

Through its support of peer-reviewed research at national laboratories, universities, and private institutions, the program develops the basic knowledge needed to address the following established indicators that the BER program is committed to, and progress can be measured against:

- **Life Sciences Research**: Provide the fundamental scientific understanding of plants and microbes necessary to develop new robust and transformational basic research strategies for producing biofuels, cleaning up environmental contamination, and sequestering carbon. Seek understanding of biological effects of low doses of ionizing radiation. Develop enabling tools based on radiochemistry and imaging technologies for BER missions in bioenergy, subsurface, and climate change.

- **Environmental Remediation Research**: Provide sufficient scientific understanding such that DOE sites would be able to incorporate coupled physical, chemical and biological processes into decision making for environmental remediation and long-term stewardship.

- **Climate Change Research**: Deliver improved scientific data and models about the potential response of the Earth's climate and terrestrial biosphere to increased greenhouse gas levels for policy makers to determine safe levels of greenhouse gases in the atmosphere.

All grant applications should address one or more of these measures and/or explain how the proposed research supports the broad scientific objectives outlined above. More information on the program and the scientific research it supports can be found at our website http://www.science.doe.gov/ober/.

a) Life Sciences Research

Research is focused on using DOE's unique resources and facilities to develop fundamental knowledge of biological systems that can be used to address DOE needs in clean energy, carbon sequestration, and environmental cleanup and that will underpin biotechnology based solutions to energy challenges. The objectives are: (1) to develop the experimental and, together with the Advanced Scientific Computing Research program, the computational resources, tools, and technologies needed to understand and predict the complex behavior of complete biological systems, principally microbes and microbial communities; (2) to take advantage of the remarkable high throughput and cost-effective DNA sequencing capacity at the Joint Genome Institute to meet the DNA sequencing needs of the scientific community through competitive, peer-reviewed nominations for DNA sequencing; (3) to understand and characterize the risks to human health from exposures to low levels of ionizing radiation; (4) to operate experimental biological stations at synchrotron and neutron sources; (5) to anticipate and address ethical, legal, and social implications arising from Office of Science-supported biological research, especially synthetic biology and nano technology and (6) to develop radiochemistry and advanced technologies for imaging and high through-put characterization and analysis for BER missions in bioenergy, subsurface, and climate change.

Program Contact: (301) 903-3213

b) Environmental Remediation Research

The program supports research to understand the processes controlling DOE-relevant contaminant mobility in the subsurface; to exploit that understanding in ways that ameliorate the impacts of subsurface contamination; and to develop the tools needed to accomplish these goals. The aim of the program is to provide the scientific knowledge, tools, and enabling discoveries needed to reduce the costs, risks, and schedules associated with the cleanup and stewardship of the DOE complex. Basic scientific knowledge and tools developed through this program will elucidate the fundamental mechanisms of contaminant transport in the environment. Research priorities include contaminant fate and transport assessment and simulation, fundamental science supporting subsurface remediation (e.g., bioremediation), and the development of tools and techniques to evaluate and/or validate conceptual models of contaminant mobility in the subsurface. The research performed for this program will provide fundamental knowledge on a broad range of DOE-specific environmental remediation problems. Applications should address the applicability of the proposed research on subsurface transport processes of DOE relevant contaminants in the context of remediation and/or long-term stewardship of DOE sites.

Program Contact: (301) 903-3281

c) Climate Change Research

The program seeks to understand the basic physical, chemical, and biological processes of the Earth's System and how these processes may be affected by energy production and use. The research is designed to provide data that will enable an objective, scientifically-based assessment of the potential for, and the consequences of, human-induced climate change at global and regional scales. Climate Change Research also provides data and models to enable assessments of mitigation options to prevent such a change. The program is comprehensive with an emphasis on: (1) understanding and simulating the radiation balance from the surface of the Earth to the top of the atmosphere (including the effect of clouds, water vapor, trace gases, and aerosols); (2) enhancing and evaluating the quantitative models necessary to predict natural climatic variability and possible human- caused climate change at global and regional scales; (3) understanding and simulating the net exchange of carbon dioxide between the atmosphere, and terrestrial systems, as well as the effects of climate change on the global carbon cycle; (4) understanding ecological effects of climate change; (5) improving approaches to integrated assessments of effects of, and options to mitigate, climatic change; and (6) basic research directed at understanding options for sequestering excess atmospheric carbon dioxide in terrestrial ecosystems, including potential environmental implications of such sequestration.

Program Contact: (301) 903-3281

7. Workforce Development for Teachers and Scientists

This program provides a continuum of opportunities to the Nation's K-16 students and teachers/faculty in science, technology, engineering and mathematics (STEM) areas. This program funds student internships, faculty and teacher fellowships and professional development programs. The goal of this program is to prepare a diverse workforce of scientists, engineers, and educators to keep America at the forefront of innovation, by utilizing its unique intellectual and physical resources to enhance the ability of educators and our Nation's educational systems to teach science and mathematics.

Program Contact: Sue Ellen Walbridge (202) 586-7231

Program Website: www.scied.science.doe.gov

PART II – AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT.

DOE anticipates awarding both grants and cooperative agreements under this program announcement. If it is determined that a cooperative agreement is the appropriate award instrument, the nature of the Federal involvement will be included in a special award condition.

B. ESTIMATED FUNDING.

It is anticipated that approximately $400 million will be available for grant and cooperative agreement awards in FY 2009. The DOE is under no obligation to pay for any costs associated with the 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 Notice.

C. MAXIMUM AND MINIMUM AWARD SIZE.

Ceiling (i.e., the maximum amount for an individual award made under this announcement): None

Floor (i.e., the minimum amount for an individual award made under this announcement): None

D. EXPECTED NUMBER OF AWARDS.

N/A

E. ANTICIPATED AWARD SIZE.

N/A

F. PERIOD OF PERFORMANCE.

N/A

G. TYPE OF APPLICATION.

DOE will accept only new applications under this Announcement.

PART III - ELIGIBILITY INFORMATION

A. **ELIGIBLE APPLICANTS.**

All types of applicants are eligible to apply except other Federal agencies, Federally Funded Research and Development Center (FFRDC) Contractors, and non-profit organizations described in section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995.

B. COST SHARING

Cost sharing is not required.

C. OTHER ELIGIBILITY REQUIREMENTS

N/A

PART 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 and/or the funding opportunity number located on the cover of this announcement and then follow the prompts to download the application package.

B. LETTER OF INTENT AND PRE-APPLICATION.

1. Letter of Intent.

Letters of Intent are not required.

2. Pre-Application.

Pre-Applications are not required.

C. CONTENT AND FORM OF APPLICATION – SF 424

You must complete the mandatory forms and any applicable optional forms (e.g., SF-LLL-Disclosure of Lobbying Activities) 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**.

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. To activate the instructions, turn on the "Help Mode" (Icon with the pointer and question mark at the top of the form). The list of certifications and assurances referenced in Field 18 can be found on the DOE Financial Assistance Forms page at http://management.energy.gov/business_doe/business_forms.htm, under Certifications and Assurances.

2. RESEARCH AND RELATED Other Project Information.
Complete questions 1 through 5 and attach files. The files must comply with the following instructions:

Project Summary/Abstract (Field 6 on the Form)
The project summary/abstract must contain a summary of the proposed activity suitable for dissemination to publication. It should be a single page that identifies the name of the applicant, the project director/principal investigator(s), the project title, 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). This document must not include any proprietary or sensitive business information as the Department may make it available to the public. The project summary must not exceed one page when printed using

standard 8.5” by 11” paper with 1” margins (top, bottom, left and right) with font not smaller than 11 point. To attach a Project Summary/Abstract, click “Add Attachment.”

Project Narrative (Field 7 on the form)
There is no page limit to the project narrative. When printed using standard 8.5” by 11” paper the margin should be 1 inch (top, bottom, left, and right). The font must not be smaller than 11 point. Do not include any Internet addresses (URLs) that provide information necessary to review the application, because the information contained in these sites will not be reviewed. **All applications should be in a single PDF file.** To attach a Project Narrative, click “Add Attachment.”

The Research & Related Other Project Information form of the Grants.gov template should be completed in the following manner. **Project Narrative is Field 7 on the form.**

The first page of your narrative must include the following information:

Applicant/Institution:
Street Address/City/State/Zip:
Principal Investigator:
Address:
Telephone Number:
Email:
DOE/Office of Science Program Office:
DOE/Office of Science Program Manager Contact:

Is this a Collaboration? If yes, please list ALL Collaborating Institutions/PIs and indicate which ones will also be submitting applications. Also indicate the PI who will be the point of contact and coordinator for the combined research activity.

* Note that collaborating applications must be submitted separately.

Biographical Sketches
Current and Pending Support for each senior investigator
Letters of Intent from collaborators (if applicable)
Facilities and Resources description
Literature Cited

The project narrative must include: **(and any other items as listed in the Funding Opportunity Description above)**

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

Appendix 1: Biographical Sketch Appendix.

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 information for each person must not exceed 2 pages when printed on 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right) with font not smaller than 11 point and must include:

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

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

Publications. Provide a list of up to 10 publications most closely related to the proposed project. For each publication, identify the names of all authors (in the same sequence in which they appear in the publication), the article title, book or journal title, volume number, page numbers, year of publication, and website address if available electronically.

Patents, copyrights and software systems developed may be provided in addition to or substituted for publications.

Synergistic Activities. List no more than 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. 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) during the last 5 years. Also, list the names and current organizational affiliations of your graduate students and postdoctoral associates during the past 5 years.

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. Concurrent submission of an application to other organizations for simultaneous consideration will not prejudice its review.

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. 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. **In order to reduce the number of files attached to your application, please provide the Bibliography and References Cited information as an appendix to your project narrative.**

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. **In order to reduce the number of files attached to your application, please provide the Facility and Other Resource information as an appendix to your project narrative.**

Appendix 5: Equipment.
List major items of equipment already available for this project and, if appropriate identify location and pertinent capabilities. **In order to reduce the number of files attached to your application, please provide the Equipment information as an appendix to your project narrative.**

Appendix 6: Other Attachments.
If you need to elaborate on your responses to questions 1-5 on the "Other Project Information" document, **provide the information as an appendix to your project narrative.**

Do not attach any of the requested appendices described above as files for fields 8, 9, 10, and 11, instead follow the above instructions to include the information as appendices to the project narrative file.

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 announcement (See PART IV, G).

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; material 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. If cost sharing is required, provide an explanation of the source, nature, amount and availability of any proposed cost sharing. Attach a single budget justification file for the entire project period in Field K. The file automatically carries over to each budget year.

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 subawardee (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.

4. **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.

5. **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."

Summary of Required Forms/Files

Your application must include the following documents:

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 6
Project Narrative, including required appendices	PDF	Field 7
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. **Pre-application Due Date.**
   Pre-applications are not required.

2. **Application Due Date**.
   This announcement will remain open until September 30, 2009, 8:00 PM Eastern Time, or until it is succeeded by another issuance, whichever occurs first. This annual Notice DE-PS02-09ER09-01 succeeds Notice DE-PS02-08ER08-01, which was published October 1, 2007.

F. INTERGOVERNMENTAL REVIEW

This program is subject to Executive Order 12372 (Intergovernmental Review of Federal Programs) and the regulations at 10 CFR Part 1005.

One of the objectives of the Executive order is to foster an intergovernmental partnership and a strengthened federalism. The Executive order relies on processes developed by State and local governments for coordination and review of proposed Federal financial assistance.

Applicants should contact the appropriate State Single Point of Contact (SPOC) to find out about, and to comply with, the State's process under Executive Order 12372. The names and addresses of the SPOCs are listed on the Web site of the Office of Management and Budget at http://www.whitehouse.gov/omb/grants/spoc.html.

G. FUNDING RESTRICTIONS.

Cost Principles**.** Costs must be allowable in accordance with the applicable Federal cost principles referenced in 10 CFR part 600.

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 part 600. 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.

2. Registration Process.

You must COMPLETE the one-time registration process (all steps) before you can submit your first application through Grants.gov (See www.grants.gov/GetStarted). **We recommend that you start this process at least three weeks before the application due date**. It may take 21 days or more to complete the entire process. Use the Grants.gov Organizational Registration Checklists at http://www.grants.gov/assets/OrganizationRegCheck.doc to guide you through the process. IMPORTANT: During the CCR 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).

Application Receipt Notices

After an application is submitted, the Authorized Organization Representative (AOR) will receive a series of five 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. When the AOR receives email Number 5, it is their responsibility to follow the instructions in the email to logon to IIPS and verify that their application was received by DOE. You will need the Submission Receipt Number (email Number 1) to track a submission. The titles of the five 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
Number 5 – DOE e-Center Grant Application Received

The last email will contain instructions for the AOR to register with the DOE e-Center. If the AOR is already registered with the DOE e-Center, the title of the last email changes to:

Number 5 – DOE e-Center Grant Application Received and Matched

This email will contain the direct link to the application in IIPS. The AOR will need to enter their DOE e-Center user id and password to access the application.

Part V - APPLICATION REVIEW INFORMATION

A. CRITERIA

1. Initial Review Criteria.

Prior to a comprehensive merit evaluation, DOE will perform an initial review in accordance with 10 CFR 605.10(b).

2. Merit Review Criteria

Applications will be subjected to scientific merit review (peer review) and will be evaluated against the following evaluation criteria which are listed in descending order of importance codified at 10 CFR 605.10(d):

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

The evaluation process will include program policy factors such as the relevance of the proposed research to the terms of the announcement and the agencies' 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.

B. REVIEW AND SELECTION PROCESS.

1. Merit Review.

Applications will be subjected to formal merit review (peer review) and will be evaluated against the evaluation criteria codified at 10 CFR 605.10(d) listed above, as well as the additional criteria listed above.

2. Selection.

The Selection Official will consider the merit review recommendation, program policy factors, and the amount of funds available.

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 part 600 and 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 eight months. The time interval begins on the date applications are due or the date the application is received, if there is no specified due date/deadline.

Part VI - AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES.

1. Notice of Selection.

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

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.

A Notice of Financial Assistance Award 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 part 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 Part 600 and 10 CFR Part 605 (See: http://ecfr.gpoaccess.gov), except for grants made to Federal Demonstration Partnership (FDP) institutions. The FDP terms and conditions and DOE FDP agency specific terms and conditions are located on the National Science Foundation web site at http://www.nsf.gov/awards/managing/fed_dem_part.jsp.

2. Special Terms and Conditions and National Policy Requirements.

Special Terms and Conditions and National Policy Requirements.
The DOE Special Terms and Conditions for Use in Most Grants and Cooperative Agreements are located at http://management.energy.gov/business_doe/business_forms.htm. The National Policy Assurances to Be Incorporated As Award Terms are located at http://management.energy.gov/business_doe/business_forms.htm.

Intellectual Property Provisions.
The standard DOE financial assistance intellectual property provisions applicable to the various types of recipients are located at http://www.gc.energy.gov/financial_assistance_awards.htm.

C. REPORTING.

Reporting requirements are identified on the Federal Assistance Reporting Checklist, DOE F 4600.2, attached to the award agreement.

PART VII - QUESTIONS/AGENCY CONTACTS

A. QUESTIONS

Questions regarding the content of the announcement must be submitted through the "Submit Question" feature of the DOE Industry Interactive Procurement System (IIPS) at http://e-center.doe.gov. Locate the program announcement on IIPS and then click on the "Submit Question" button. Enter required information. You will receive an electronic notification that your question has been answered. DOE will try to respond to a question within 3 business days, unless a similar question and answer have already been posted on the website.

Questions relating to the 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.

B. AGENCY CONTACTS

Questions regarding the specific program areas/technical requirements should be directed to the point of contact listed for each program office within the Notice and not to the Notice Administrative Contact.

PART VIII - OTHER INFORMATION

A. MODIFICATIONS.

Notices of any modifications to this announcement will be posted on Grants.gov and the DOE Industry Interactive Procurement System (IIPS). You can receive an email when a modification or an announcement message is posted by joining the mailing list for this announcement through the link in IIPS. When you download the application at Grants.gov, you can also register to receive notifications of changes through Grants.gov.

B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE.

DOE reserves the right, without qualification, to reject any or all applications received in response to this announcement 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 confidentional 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 U.S.C. 5908 provides that title to such inventions vests in the United States, except where 35 U.S.C. 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 announcement, 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.

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

N/A

I. REFERENCE MATERIAL

N/A