

**Office of Science**  
**Notice 99-01**

**Annual Notice of Continuation of Availability of  
Grants and Cooperative Agreements**

Department of Energy  
Office of Science

Continuation of Solicitation for the Office of Science (Formerly the Office of Energy Research) Financial Assistance Program  
Notice 99-01

AGENCY: U.S. Department of Energy

ACTION: Annual Notice of Continuation of Availability of Grants and Cooperative Agreements

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, Computational and Technology Research, Fusion Energy Sciences, Biological and Environmental Research and Energy Research Analyses. On September 3, 1992, (57FR40582), DOE published in the Federal Register the Office of Energy Research 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.

DATES: Applications may be submitted at any time in response to this Notice of Availability.

ADDRESSES: Applications must be sent to: Director, Grants and Contracts Division, Office of Science, SC-64, U.S. Department of Energy, 19901 Germantown Road, Germantown, MD 20874-1290. When preparing applications, applicants should use the Office of Science Financial Assistance Program Application Guide and Forms located on the World Wide Web at:

<http://www.er.doe.gov/production/grants/grants.html>. Applicants without Internet access may call 301-903-5212 for information.

**SUPPLEMENTARY INFORMATION:** This Notice is published annually and remains in effect until it is succeeded by another issuance by the Office of Science. This annual Notice 99-01 succeeds Notice 98-01 which was published October 31, 1997.

It is anticipated that approximately \$400 million will be available for grant and cooperative agreement awards in FY 1999. 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.

In addition, 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 Basic Energy Sciences (BES) program supports fundamental research in the natural sciences and engineering leading to new and improved energy technologies and to understanding and mitigating the environmental impacts of energy technologies. The science divisions and their objectives are as follows:

#### **(a) Materials Sciences**

The objective of this program is to increase the understanding of phenomena and properties important to materials behavior that will contribute to meeting the needs of present and future energy technologies. It is comprised of the subfields metallurgy, ceramics, solid state physics, materials chemistry, and related disciplines where the emphasis is on the science of materials.

Program Contact: (301) 903-3427

#### **(b) Chemical Sciences**

The objective of this program is to expand, through support of basic research, knowledge of various areas of chemistry, chemical engineering and atomic molecular and optical physics with a goal of contributing to new or improved processes for developing and using domestic energy resources in an efficient and environmentally sound manner. Disciplinary areas where research is supported include atomic molecular and optical physics; physical, inorganic and organic chemistry; chemical physics; photochemistry; radiation chemistry; analytical chemistry; separations science; actinide chemistry; and chemical engineering sciences.

Program Contact: (301) 903-5804

#### **(c) Engineering Research**

This program's objectives are: (1) to extend the body of knowledge underlying current engineering practice in order to open new ways for enhancing energy savings and

production, prolonging useful equipment life, and reducing costs while maintaining output performance, and environmental quality; and (2) to broaden the technical and conceptual base for solving future engineering problems in the energy technologies. Long-term research topics of current interest include: foundations of bioprocessing of fuels and energy related wastes, fracture mechanics, experimental and theoretical studies of multi phase flows, intelligent machines, and diagnostics and control for plasma processing of materials.

Program Contact: (301) 903-5822

#### **(d) Geosciences**

The goal of this program is to develop a quantitative and predictive understanding of the energy-related aspects of processes in the earth. The emphasis is on the upper levels of the earth's crust and the focus is on geophysics, geomechanics and geochemistry of rock-fluid systems and interactions emphasizing processes taking place at the atomic and molecular scale. Specific topical areas receiving emphasis include: high resolution geophysical imaging; rock physics, fundamental properties and interactions of rocks, minerals, and fluids; and sedimentary basin systems. The resulting improved understanding and knowledge base are needed to assist efforts in the utilization of the Nation's energy resources in an environmentally acceptable fashion.

Program Contact: (301) 903-5822

#### **(e) Energy Biosciences**

The primary objective of this program is to generate the fundamental understanding of biological mechanisms in the areas of botanical and microbiological sciences that will support biotechnological developments related to DOE's mission. The research serves as the basic information foundation with respect to an environmentally responsible renewable resource production for fuels and chemicals, microbial conversions of renewable materials and biological systems for the conservation of energy. This office has special requirements for the submission of preapplications, when to submit, and the length of the applications. Applicants are encouraged to contact the office regarding these requirements.

Program Contact: (301) 903-2873

## **2. High Energy and Nuclear Physics**

This program supports about 90% of the U.S. efforts in high energy and nuclear physics. The objectives of these programs are indicated below:

#### **(a) High Energy Physics**

The primary objectives of this program are to understand the ultimate structure of matter in terms of the properties and interrelations of its basic constituents, and to understand the nature and relationships among the fundamental forces of nature. The

research falls into three broad categories: experimental research, theoretical research, and technology R&D in support of the high energy physics program.

Program Contact: (301) 903-3624

#### **(b) Nuclear Physics (Including Nuclear Data Program)**

The primary objectives of this program are an understanding of the interactions and structures of atomic nuclei and nuclear matter at the most elementary level possible, and an understanding of the fundamental forces of nature as manifested in nuclear matter.

Program Contact: (301) 903-3613

### **3. Computational and Technology Research**

The goal of this program is to conduct an integrated program in applied mathematical sciences, high performance computing and communications, information infrastructure, advanced energy projects research, and technology research, to address complex problems. Research in forefront and diverse programs is becoming more multi disciplinary and requires new approaches to the solution of these complex problems. The program exploits the capabilities and research skills at universities, national laboratories, and industrial research laboratories. The program provides technical, analytical, and management direction for development, implementation, and evaluation of research programs that include activities from fundamental research to technology development. The goal of the program is accomplished through the effort of the following two divisions:

**(a) Mathematical, Information, and Computational Sciences** This subprogram supports a spectrum of fundamental research in applied mathematical sciences, computer science, and networking from basic through prototype development. Results of these efforts are used to form partnerships with users in scientific disciplines to validate the usefulness of the ideas and to develop them into tools. Testbeds on important applications for DOE are supported by this subprogram.

Program Contact: (301)-903-5800

#### **(b) Advanced Energy Projects/Laboratory Technology Research**

**Advanced Energy Projects** - This activity funds research to establish the feasibility of novel, energy-related concepts. These concepts are usually derived from recent advances in basic research, but require additional research to establish their feasibility. A common theme for each concept is the initial linkage of new, or previously neglected, research results to a practical energy payoff for the Nation.

**Laboratory Technology Research** - This subprogram conducts high risk, energy-related research that advances fundamental science and technology toward innovative applications that could significantly impact the Nation's energy economy. Scientists at

the Office of Science laboratories enter into cost-shared research partnerships with industry to explore energy applications of research advances in areas of mission relevance to both parties. The partners jointly bring technology research to a point where industry or the Department's technology development programs can pursue final development or commercialization. Current research projects emphasize advanced materials, intelligent processes and controls, and energy-related applications of biotechnology.

Program Contact: (301)-903-5995

#### **4. Fusion Energy Sciences**

The mission of the Fusion Energy Sciences program is to advance plasma science, fusion science, and fusion technology - the knowledge base needed for an economically and environmentally attractive fusion energy source. This program is supported by the Office of Fusion Energy Sciences (OFES), which fosters both applied and basic research and emphasizes international collaboration to accomplish this mission.

##### **(a) Science Division**

This Division seeks to develop the physics knowledge base needed to advance the Fusion Energy Sciences program toward its goals. Basic and applied research is carried out in the following areas: (1) basic plasma science research directed at furthering the understanding of fundamental processes in plasmas; (2) improving the theoretical understanding of fusion plasmas necessary for interpreting results from present experiments and the planning and design of future confinement devices, (3) obtaining the critical data on plasma properties, atomic physics and new diagnostic techniques for support of confinement experiments, (4) supporting exploratory research into concepts that are alternatives to the tokamak, and (5) carrying out research on issues that support the development of Inertial Fusion Energy, for which target development is carried out by the Department of Energy's Defense Programs.

Research into basic physics issues associated with medium to large scale confinement devices is essential to studying conditions relevant to the production of fusion energy. Experiments on these scale of devices are used to explore the limits of specific confinement concepts, as well as study associated physical phenomena. Specific areas of interest include: (1) the production of increased plasma densities and temperatures, (2) the understanding of the physical laws governing plasma energy of high plasma pressure, (4) the investigation of plasma interaction with radio frequency waves, and (5) the study and control of particle transport and exhaust in plasmas.

Program Contact: (301) 903-4095

##### **(b) Technology Division**

This Division seeks to develop the technology knowledge base needed to advance the

Fusion Energy Sciences program toward its goals. The Division's science-oriented goal is to provide the technologies that are required to successfully design, build, and operate near-term experiments aimed at producing, understanding, and optimizing the fusion energy process. The Division's energy-oriented goal is to develop the technologies that will be needed in the long-term for an economically and environmentally attractive fusion energy source. These goals are pursued through multi-institutional domestic programs and international collaboration partnerships. Program Contact: (301) 903-5378

## **5. Biological and Environmental Research Program**

The goals of the Biological and Environmental Research Program are as follows: (1) to provide, through basic and applied research, the scientific information required to identify, understand and anticipate the long-term health and environmental consequences of energy use and development; and (2) to utilize the Department's unique resources to solve major scientific problems in medicine, biology and the environment. Goals of the program are accomplished through the efforts of the following research program elements:

### **(a) Health Effects and Life Sciences Research**

This is a broad program of basic and applied biological research. The objectives are: (1) to create and apply new technologies and resources in mapping, sequencing, and information management for characterizing the molecular nature of the human genome; (2) to develop and support DOE national user facilities for use in fundamental structural biology; (3) to use model organisms to understand human genome organization, human gene function and control, and the functional relationships between human genes and proteins; (4) to characterize and exploit the genomes and diversity of microbes with potential relevance for energy, bioremediation, or global climate; (5) to understand and characterize the risks to human health from exposures to low levels of radiation and chemicals; (6) to develop novel technologies for high throughput determination of protein structure; and (7) to anticipate and address ethical, legal, and social implications arising from genome research.

Program Contact: (301) 903-5468

### **(b) Medical Applications and Measurement Science**

The objectives of this program comprise the following areas: (1) to develop technologies for the beneficial applications of radiation and in vivo radiotracer detection in the study, diagnosis and treatment of human diseases and disorders; (2) to develop new instrumentation for biological and medical research; and (3) to develop new concepts and techniques for detecting and measuring the hazardous agents of biochemical, physical and environmental consequences related to energy production.

Program Contact: (301) 903-3213

### **(c) Environmental Remediation**

The objectives of the program relate to environmental processes affected by energy production and use. The program develops information on the physical, chemical and biological processes that cycle and transport energy-related material, particularly contaminants that arose during nuclear weapons production, through the Earth's surface and subsurface. Emphasis is put on the development of a strong basis for understanding and implementing the appropriate and efficient use of bioremediation, particularly at the Department's sites.

Program Contact: (301) 903-3281

### **(d) Environmental Processes**

This program addresses global environmental change from increases in atmospheric carbon dioxide and other greenhouse gases. The scope of the global change program encompasses the carbon cycle, climate modeling and diagnostics, atmospheric sciences and meteorology, ecosystem responses, and impacts on resources. The role of clouds and radiation in climate prediction is a particular emphasis.

Program Contact: (301) 903-3281

## **6. Energy Research Analyses**

This program supports energy research analyses of the Department's basic and applied research activities. Specific objectives include assessments to identify any duplication or gaps in scientific research activities, and impartial and independent evaluations of scientific and technical research efforts.

Program Contact: (202) 586-7021

## **7. 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. This program addresses research needs across all of the Department of Energy research interests. Research supported by the EPSCoR program is concerned with the same broad research areas addressed by the Office of Science programs that are described above. The EPSCoR program is restricted to applications which originate in eighteen states (Alabama, Arkansas, Idaho, Kansas, Kentucky, Louisiana, Maine, Mississippi, Montana, Nebraska, Nevada, North Dakota, Oklahoma, South Carolina, South Dakota, Vermont, West Virginia, and Wyoming) and the commonwealth of Puerto Rico. It is anticipated that in Fiscal Year 1999, only a limited number of new competitive research grants will be awarded under this program due to prior commitments to ongoing EPSCoR grant projects.

Program Contact: (301) 903-3427

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