

Office of Science
Notice 02-19

*Innovations in Fusion Energy
Confinement Systems*

Department of Energy

Office of Science Financial Assistance Program Notice 02-19; Innovations in Fusion Energy Confinement Systems

AGENCY: U.S. Department of Energy

ACTION: Notice inviting grant applications.

SUMMARY: The Office of Fusion Energy Sciences (OFES) of the Office of Science (SC), U.S. Department of Energy (DOE), hereby announces its interest in receiving grant applications for innovative experiments in fusion energy confinement systems. Organizations with research projects funded under previous notices for this topic that are now due for continuation funding need not submit; however, those seeking renewal funding in Fiscal Year 2003, should submit a renewal application under this Notice. Successful applications will be funded early in Fiscal Year 2003.

The Office of Fusion Energy Sciences is interested in applications for innovative fusion energy experimental research. The specific areas of interest are:

1. Innovative Approaches to Understanding Plasmas
2. Innovative Confinement Concepts
3. Innovative Plasma Operations in Support of Proof of Principle (POP), Performance Extension (PE), and Burning Plasma Experiments

More specific information on each area of interest is outlined in the general and program specific information section below.

The research should be aimed at experimentally elucidating the physics principles involved. Research projects are sought which are unique, first of a kind and which provide new scientific insights. Although the main thrust of this initiative is experimental, consideration will also be given to applications that are directed at scientific assessment of new concepts, approaches, and plasma operations that are not ready for experimental investigation. Applications for research on existing large experiments, or initiatives in Inertial Fusion Energy should not be submitted in response to this notice. Collaborative applications submitted from different institutions that are directed at a single proposed experiment will be "bundled" and reviewed collectively.

Due to the limited availability of funds, Principal Investigators with continuing grants may not submit a new application in the same area(s) of interest as their current grant(s). A Principal Investigator may submit only one application under each area of interest as listed above.

DATES: To permit timely consideration for awards in Fiscal Year 2003, applications submitted in response to this notice must be received by DOE no later than 4:30 p.m., E.D.T., May 15, 2002. No electronic submissions of formal applications will be accepted.

ADDRESSES: Completed formal applications referencing Program Notice 02-19 should be forwarded to: U.S. Department of Energy, Office of Science, Grants and Contracts Division, SC-64, 19901 Germantown Road, Germantown, Maryland 20874-1290, ATTN: Program Notice 02-19. The above address must also be used when submitting applications by U.S. Postal Service Express, any commercial mail delivery service, or when hand carried by the applicant.

FOR FURTHER INFORMATION CONTACT: Specific contacts for each area of interest, along with telephone numbers and Internet addresses, are listed below:

Innovative Approaches to Understanding Plasmas: Steve Eckstrand, Research Division, SC-55, Telephone: (301) 903-5546, or by Internet address: steve.eckstrand@science.doe.gov

Innovative Confinement Concepts: Dr. Curtis W. Bolton III, Research Division, SC-55, Telephone: (301) 903-4914, or by Internet address: curt.bolton@science.doe.gov

Innovative Plasma Operations in Support of POP, PE, and Burning Plasma Experiments: Chuck Finfgeld, Research Division, SC-55, Telephone: (301) 903-3423, or by Internet address: charles.finfgeld@science.doe.gov

SUPPLEMENTARY INFORMATION:

General information about development and submission of applications, eligibility, limitations, evaluations and selection processes, and other policies and procedures may be found in the Application Guide for the Office of Science Financial Assistance Program and 10 CFR Part 605. Electronic access to SC's Financial Assistance Guide and required forms is possible via the Internet using the following Web site address:

<http://www.science.doe.gov/production/grants/grants.html>. DOE is under no obligation to pay for any costs associated with the preparation or submission of an application if an award is not made.

In selecting applications for funding, the DOE Office of Fusion Energy Sciences will give priority to applications that can produce experimental results within three to five years after grant initiation. Theoretical research will be accepted for consideration under this Notice when bundled with and in support of an experimental application. The detailed description of the proposed project should contain the following items: (1) A detailed experimental research plan, (2) The specific results or deliverable expected at the end of the project period, (3) Goal of the experiment, (4) Synopsis of the experimental program plan, (5) Adequacy of the facilities and budget, (6) Discussion of why this research would have an important impact on the prospects for

fusion energy, and (7) Discussion of how the experiment would elucidate the physics principles of the innovation.

Applications concerned with scientific assessment of new concepts, approaches, and plasma operations that are not ready for experimental investigation should have a well-defined scope and duration of no more than two years. These applications will be considered non-renewable. The product of such assessment would be a clear scientific description of the concept and its operation, its physics and engineering basis, critical analysis of major difficulties to be overcome in developing the concept as a net producer of energy through the fusion process, and an analysis of what would be achieved by moving to experimental research.

Program Funding

It is anticipated that up to \$4,500,000 in Fiscal Year 2003, will be available to start new projects from applications received in response to this Notice. The number of awards and range of funding will depend on the number of applications received and selected for award. Future year funding is anticipated to be greater but will depend on the nature of the applications, suitable experimental progress and the availability of funds. The cost-effectiveness of the application will be considered when comparing applications with differing funding requirements. Applications for scientific assessment of new concepts will be limited to a maximum of \$150,000 in any year. Applications requiring annual funding as low as \$50,000 are welcome and encouraged.

To enable all reviewers to read all applications, the application must be limited to a maximum of twenty (20) pages (including text and figures) plus not more than one page each of biographical information and publications of the principal investigator, plus any additional forms required as a part of the standard grant application.

An original and seven copies of each application must be submitted. Due to the anticipated number of reviewers, it would be helpful for each applicant to submit an additional seven copies of each application. In lieu of the seven additional copies, applicants may provide a CD-ROM containing the application in Portable Document Format (PDF). The label on the CD must clearly identify the institution, principal investigator, and title of the application. (If the applicant elects to submit a CD, an original and seven copies of the application must still be submitted.)

Merit Review

Applications will be subjected to formal merit review and will be evaluated against the following criteria, which are listed in descending order of importance as set forth in 10 CFR Part 605:

1. Scientific and/or technical merit of the project;
2. Appropriateness of the proposed method or approach;
3. Competency of the applicant's personnel and adequacy of the proposed resources;
4. Reasonableness and appropriateness of the proposed budget.

The Office of Fusion Energy Sciences shall also consider, as part of the evaluation, other available advice or information as well as program policy factors such as ensuring an appropriate balance among the program areas and within the program areas, coupling to theory and

computational support, and quality of previous performance. Strong preference will be given to proposals for work based in the United States. Selection of applications/proposals for award will be based upon the findings of the technical evaluations, the importance and relevance of the proposed research to the Office of Fusion Energy Sciences' mission, and funding availability.

Program Specific Supplementary Information:

1. Innovative Approaches to Understanding Plasmas: These are innovative experiments aimed at understanding some key scientific issue of importance to fusion energy. This could include experiments aimed at understanding turbulence and zonal flows, understanding reconnection, or understanding other outstanding fusion energy sciences issues.

2. Innovative Confinement Concepts: This is innovative experimental research that has the possibility of leading to improved fusion energy power plants.

3. Innovative Plasma Operations in Support of POP, PE, and Burning Plasma Experiments: The fusion program has a number of confinement concepts that have passed beyond the exploratory stage to either the POP, PE, or the burning plasma stages. Innovative Plasma Operations is aimed at developing the science and understanding of new ways to enhance the performance of the POP, PE, or burning plasma experiments. This could include work on stabilizing resistive wall modes, new methods of turbulence suppression, methods to suppress neo-classical tearing modes, and novel methods to use fusion energetic particles.

The Catalog of Federal Domestic Assistance number for this program is 81.049, and the solicitation control number is ERFAP 10 CFR Part 605.

John Rodney Clark
Associate Director of Science
for Resource Management

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