

Office of Science
Notice DE-FG01-03ER03-26

Fusion Science Centers

Department of Energy

Office of Science Financial Assistance Program Notice DE-FG01-03ER03-26; Fusion Science Centers

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), announces its interest in receiving grant applications for Fusion Science Centers with a research focus in fusion plasma science. The duration of the Center grant will be five years, with the possibility of a one time renewal for five more years. All institutions or groups planning to submit applications for funding a new center in Fiscal Year 2004 should submit in response to this Notice. Applicants are not being asked, in any way, to fund or establish a Federally Funded Research and Development Center (FFRDC).

DATES: To permit timely consideration for awards in Fiscal Year 2004, applicants are **required** to submit a Preliminary Application by November 14, 2003. Following a review of the Preliminary Application, applicants may be invited to submit a Full Application in response to this notice which must be received by DOE no later than 4:30 p.m., March 1, 2004. Electronic submission of formal applications in PDF format is required.

Applicants are requested to submit a letter-of-intent by October 15, 2003. Letters-of-Intent should be sent by E-mail to the following E-mail address: john.sauter@science.doe.gov and the subject line should state: Letter-of-Intent regarding Program Notice DE-FG01-03ER03-26.

ADDRESSES: A copy of the Preliminary Application should be sent by e-mail to: john.sauter@science.doe.gov with a subject line titled Preliminary Application Regarding Program Notice DE-FG01-03ER03-26. In addition, you must provide two CDs, with one PDF file copy of the Preliminary Application on each, to be sent Federal Express to: John Sauter, SC-55, Office of Fusion Energy Sciences, Germantown Building, U.S. Department of Energy, 19901 Germantown Road, Germantown, MD 20874-1290.

Full Applications in response to this solicitation Number DE-FG01-03ER03-26 are to be electronically submitted by an authorized institutional business official through DOE's Industry Interactive Procurement System (IIPS) at: <http://e-center.doe.gov/>. IIPS provides for the posting of solicitations and receipt of applications in a paperless environment via the Internet. In order to submit applications through IIPS, your business official will need to register at the IIPS website. It is suggested that this registration be completed several days prior to the date on which you

plan to submit the formal application. The Office of Science will include attachments as part of this notice that provide the appropriate forms in PDF fillable format that are to be submitted through IIPS. IIPS offers the option of submitting multiple files—please limit submissions to only one file within the volume if possible, with a maximum of no more than four files.

Questions regarding the operation of IIPS may be e-mailed to the IIPS Help Desk at: helpdesk@pr.doe.gov, or you may call the help desk at: (800) 683-0751. Further information on the use of IIPS by the Office of Science is available at:

<http://www.sc.doe.gov/production/grants/grants.html>.

FOR FURTHER INFORMATION CONTACT: Dr. Michael D. Crisp, Research Division, SC-55, Office of Fusion Energy Sciences, Germantown Building, U.S. Department of Energy, 1000 Independence Avenue, SW, Washington, DC 20585-1290. Telephone: (301) 903-4883, or by E-mail address: michael.crisp@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.sc.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.

Program Objectives

The development of new investigative techniques and research tools presents a window of opportunity for fundamental advances in the understanding of fusion plasma science. Many of the issues in plasma science are sufficiently complex that significant progress requires closely interacting, critical-mass groups of scientists with a broad mix of skills and backgrounds. There is also a need to strengthen the connection between the fusion research community and the broader scientific community. The objective of this initiative is to establish one or two university-based Fusion Science Centers (FSC), which will focus on fundamental issues in plasma science. The FSC will be supported to perform fusion plasma science research in areas of such wide scope and complexity that it would not be feasible for individual investigators or small groups to make progress. For example, understanding the dynamics of plasma turbulence and transport requires the development of appropriate physical models, computational algorithms for treating disparate space and times scales, as well as complex magnetic geometries, efficient programming on massively parallel computing platforms, and an understanding of nonlinear physics. A well coordinated collaboration of a team of scientists is more likely to have the breadth of knowledge and skills required to tackle such large and complex problems successfully. The research team that will be assembled for the FSC should also promote connectivity with the broader scientific community.

Areas of Focus

The FSC will be a university-based center of excellence that will emphasize scientific issues that are of fundamental importance to fusion plasma science. Examples of topics that could serve as a focus of a FSC include, but are not limited to: turbulence and transport, chaos and self-organization, energetic particle dynamics, and high energy density plasma physics.

Educational Component

Since future manpower requirements of the fusion energy sciences program are an important concern, proposals should discuss effective ways in which education and training are integrated within their research programs. Centers should be expected to sponsor multidisciplinary workshops and summer schools that will bring together students and researchers from various fields and institutions to focus on basic plasma science. The workshops should also serve to communicate the advances and challenges of fusion science to the broader scientific community.

Eligibility Information

Applications are sought from academic institutions and groups, within the United States, which have research and educational programs in plasma science. The Center is expected, and encouraged, to participate in collaborations with other research institutions. The FSC is envisioned to combine the expertise and approaches of national laboratories and universities. However, since the thrust of this initiative is for university-based institutions, any participation of a FFRDC, including a Department of Energy National Laboratory, should be limited to no more than 20 percent of the Center funding.

Cost Sharing

The host institution is required to provide at least 15 percent matching funds for the Center.

Application Process

Applicants are requested to submit a letter-of-intent as stated above. Applicants will be **required** to submit a detailed Preliminary Application that will be reviewed by a panel of experts. Following the review of the Preliminary Application, applicants may be invited to submit a Full Application. The Full Application will receive an extensive review which may include oral presentations by the Principal Investigator and his collaborators.

Letter-Of-Intent

Letters-of-intent must include the title of the application, the name of the Principal Investigator(s), the requested funding and a one-page abstract. These letters-of-intent will be used to organize and expedite review processes. Failure to submit a letter-of-intent will not negatively prejudice a responsive formal application submitted in a timely fashion.

Preliminary Application

The Preliminary Application should consist of a description of the research proposed to be undertaken by the Fusion Science Center including a clear explanation of its importance to the advancement of fusion plasma science. The Preliminary Application should be limited to a maximum of 30 pages (including text and figures) of technical information. It should briefly describe the institutional setting of the FSC, its proposed scope and organization, activities in research and education and their integration, development of human resources and shared experimental facilities, links with related major research centers, on campus or off campus, and a management plan. The application should emphasize the synergy of collaborations that will be facilitated by the Center. A clear case should be made that the Center's research program will contribute more to the advancement of fusion plasma science than would be expected from the independent efforts of its individual investigators. Also included should be a description of educational activities that will be an integral part of the Center's research program and other information necessary for a concise overview of the FSC activities. The FSC application should describe proposed efforts to communicate concepts, methods, tools, and results to the wider world of science in order to raise awareness of the fusion science community's scientific accomplishments.

Full Application

The Department of Energy will accept Full Applications for a Fusion Science Center by invitation only, based upon the results of an evaluation of the Preliminary Application. The Full Application should consist of a more detailed description of the material contained in the Preliminary Application. The Full Application may be modified in response to the reviewers' comments concerning the Preliminary Application. The review process for the Full Application may also include oral presentations, made to a review panel, by the proposed Center's key people.

Program Funding

It is anticipated that about \$2,000,000 of Fiscal Year 2004 funding will be available to fund one or two new Fusion Science Centers from applications received in response to this Notice. Because future year funding is not anticipated to increase, applications should propose constant effort in future years (allowing for inflation). Future year funding will depend upon suitable progress and the availability of funds. The cost-effectiveness of the application will be considered when comparing applications with differing funding requirements.

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 will 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 and within the program areas, ensuring support for major computational efforts, ensuring support for experiments, and quality of previous performance.

Additional Review Criteria

In order to encourage innovation and originality in the application, preconceived specifications are being kept to a minimum in this announcement. A proposal for a center should have a plan to identify, pose, and answer scientific questions of widely recognized importance. In all cases, however, a Center's application should demonstrate that the whole of the Center's effort will be substantially greater than the sum of its parts. Attention will be paid to the management plan, which should include a description of how the FSC will operate. The plan should also describe proposed activities that will be undertaken to enhance connectivity between the Center and the broad scientific community.

In addition to the information required by 10 CFR Part 605 each application should contain the following items: (1) a succinct statement of the goal of the research, (2) a detailed research plan, (3) the specific results expected at the end of the project period, (4) an analysis of the adequacy of the budget, (5) a discussion of the impact of the proposed research on other fields of science, and (6) for projects requiring significant computational resources (e.g., at the National Energy Research Scientific Computing Center), an estimate and justification of the resources that will be required.

With respect to the enhanced productivity that one would expect from the synergy of a Center, additional review criteria are:

- 1) Clear evidence of collaborative work.
- 2) The extent to which the group addresses difficult problems requiring a team effort.
- 3) Clear evidence of scientific leadership.
- 4) The extent to which the management will evaluate the relevance and scientific impact of the group's work.

Selection of applications for award will be based upon the findings of the technical evaluations, the importance and relevance of the proposed research to the Office of Fusion Energy Sciences' mission, and funding availability.

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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