

**Office of Science**  
**Notice DE-FG01-05ER05-09**

*Research in Innovative  
Approaches to Fusion Energy Sciences*

**Department of Energy**

**Office of Science Financial Assistance Program Notice DE-FG01-05ER05-09: Research in Innovative Approaches to Fusion Energy Sciences**

**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 intention to conduct a special review of the research in innovative approaches to fusion energy sciences. **All university or industry individuals or groups planning to submit applications for renewal or new funding in Fiscal Year 2006 should submit in response to this Notice.** In addition, the OFES requests the following projects to submit renewal applications as part of this special review: (1) The Helically Symmetric Experiment (HSX) at the University of Wisconsin - Madison and (2) The Levitated Dipole Experiment (LDX) at MIT and Columbia University. Mail reviews and a panel review are being planned for this special review. This special review is necessitated in part by a reduction of funding (of approximately \$2M per year) in the program. If additional funds should become available later, which would reverse the anticipated ICC funding shortfall, the two special projects, namely HSX and LDX, would then be exempted from the final review.

The OFES Innovative Confinement Concepts (ICC) Program has the long-term performance measure of demonstrating enhanced fundamental understanding of magnetic confinement and improved basis for future burning plasma experiments through research on magnetic confinement configuration optimization. The program is focused on resolving key scientific issues and determining the confinement characteristics of a range of attractive confinement configurations. Applications for research on the large fusion facilities (DIII-D, Alcator C-Mod, NSTX, MST, NCSX), or initiatives in Inertial Fusion Energy and High Energy Density Physics should not be submitted in response to this notice.

OFES may also solicit applications from time to time under separate announcements of Initiatives to support coordinated, goal-directed community efforts. These Initiatives will be funded to achieve specific programmatic and scientific aims and will be subject to requirements that are different from those of this notice. Such grants, if funded, will be subject to periodic reviews of progress.

**DATES: A Letter-of-Intent (LOI) to submit an application is REQUIRED and should be submitted by May 18, 2005. Failure to submit the LOI by the due date may preclude the full application from due consideration for award.**

Formal applications submitted in response to this notice must be received by DOE no later than 8:00 p.m., Eastern Time, June 23, 2005, to be accepted for merit review and to permit timely consideration for award in Fiscal Year 2006. Awardees are expected to be selected by January 2006. Electronic submission of formal applications in PDF format is required.

Please see the "Addresses" section below for further instructions on the methods of submission for the LOI and the full application.

**ADDRESSES:** Letters-of-Intent should be submitted electronically by email to Mr. John Sauter at John.Sauter@science.doe.gov, with a copy to Dr. Kenneth Hill at Kenneth.Hill@science.doe.gov, citing "Letter-of-Intent for Notice DE-FG01-05ER05-09: Research in Innovative Approaches to Fusion Energy Sciences" in the subject line of the email. The purpose of the LOI is to expedite the planning of the review of the applications. For this purpose, the LOI should contain a one-page abstract of the proposed research, together with a list of potential collaborators and their institutional affiliations, to enable potential conflict of interest issues to be determined in relation to the review.

### **Formal Applications**

For this Solicitation, the Office of Science is using [Grants.Gov](#) for the electronic submission of applications. The Funding Opportunity Number is: DE-FG01-05ER05-09 and the CFDA Number for the Office of Science is: 81.049. Instructions and forms are available on the Grants.Gov website. You must complete all the one-time actions in "Get Started" at [Grants.Gov](#) prior to submitting your initial application. Applicants who are not registered with CCR and [Grants.Gov](#) should allow at least 14 days to complete these requirements. It is suggested that the process be started as soon as possible. Please refer to the "Funding Opportunity Announcement", Part IV - Application and Submission Information; H. Other Submission and Registration Requirements, for more specific guidance on "Where to Submit" and "Registration Requirements."

**FOR FURTHER INFORMATION CONTACT:** Office of Fusion Energy Sciences, SC-55/Germantown Building, U.S. Department of Energy, 1000 Independence Avenue, SW, Washington, DC 20585-1290. Dr. Kenneth Hill is the Team Leader for the ICC Program. Contact information for members of the ICC Team is given below:

Dr. Sam Barish, SC-55, (301) 903-2917, sam.barish@science.doe.gov

Dr. Curt Bolton, SC-55, (301) 903-4914, curt.bolton@science.doe.gov

Dr. Steve Eckstrand, SC-55, (301) 903-5546, steve.eckstrand@science.doe.gov

Dr. Chuck Finfgeld, SC-55, (301) 903-3423, charles.finfgeld@science.doe.gov

Dr. Kenneth Hill, SC-55, (301) 903-0418, kenneth.hill@science.doe.gov

Dr. Francis Thio, SC-55, (301) 903-4678, francis.thio@science.doe.gov

## **SUPPLEMENTARY INFORMATION:**

In selecting experimental applications for funding, the DOE Office of Fusion Energy Sciences will give priority to applications that can produce experimental results within four years after grant initiation. Theoretical research will be accepted for consideration under this Notice when bundled with and in support of an experimental application.

In addition, applications concerned with scientific assessment of new concepts or approaches that are not ready for experimental investigation may also be considered. These applications should have a well-defined scope. 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, and an analysis of what would be achieved by moving to experimental research.

**Since we expect that reviewers will be asked to review several applications, all applications should be limited to a maximum of thirty five (35) pages (including text and figures) of technical information. Applications exceeding these page limits may be rejected without review.** The PDF file may also include a few selected publications in an Appendix as background information. In addition, in the electronic submission, please limit biographical and publication information for the principal investigator and key personnel to no more than two pages each. Each principal investigator should provide an e-mail address. The page count of 35 does not include the Face Page and Budget Pages, the Title Page, the biographical material and publication information, or any Appendices. However, it is important that the 35 page technical information section provide a complete description of the proposed work, since reviewers are not obliged to read the Appendices.

## **Application**

**The application should be prepared and each file attached within the Grants.gov Application Package according to the instructions provided. Please follow the additional guidance below, and include in the appropriate places, all the following items when preparing the attachments:**

1. Executive Summary - summarize in no more than two pages
2. Abstract - One paragraph summary of the planned work in no more than one page
3. Background and Recent Accomplishments
  - 3.1 Background
  - 3.2 Recent Accomplishments - This subsection is mandatory for renewal applications, but optional for new applications

#### 4. Proposed research

- 4.1 Detailed Plan (Scope)
- 4.2 Project schedules and milestones
- 4.3 Statement of Work and Deliverables

5. Textual Summary of Budget (in addition to the formal budget pages) - in particular, showing how the budget relates to the research and task plans

6. Management plan - if appropriate (for projects of large size and complexity)

7. Description of facilities, resources, and personnel.

8. Other current and pending support.

### **Program Funding**

It is anticipated that approximately \$6,000,000 will be available for awards in FY06, contingent upon the availability of appropriated funds. In addition, approximately \$4,700,000 will be available for competition by DOE National Laboratories under a separate solicitation (Program Announcement LAB 05-09). There are four existing projects within the ICC universities and industry sector Program scheduled for possible renewal in FY06 with a total funding amount of about \$4,400,000 in FY05. These projects are HBX, Pegasus, TCS, and HIT-SI. **It is anticipated that the funding level available in FY06 for the entire ICC program will be reduced by about \$2,000,000, relative to that available in FY05.** Thus, in order to accommodate this budget reduction and to align the ICC program according to ITER-era OFES objectives and future anticipated budgets, it is necessary for OFES to include in this year's review all other major ICC projects with annual budgets near \$1,000,000 or more which are not scheduled for review this year. These university/industry sector projects are LDX and HSX. The aggregate funding for these projects is about \$2,800,000 in FY05. If additional funds should become available later, which would reverse the anticipated ICC funding shortfall, the two special projects, namely HSX and LDX, would then be exempted from the final review.

It is anticipated that award sizes may range from \$50,000 to \$1,500,000 per year. Previous awards have ranged from \$80,000 to \$960,000 per year. The number of awards funded and the amount of funding for each grant will depend upon the number and quality of the applications received. Selection of awardees is expected to begin about January 2006. Equal consideration will be given to renewal and new applications.

Applications from universities and industry for new projects in response to this Notice will be accepted and will be reviewed and competed with the six projects specifically mentioned above; however, applicants should be aware that the reduced funding environment for FY06 and that anticipated for out-years will significantly limit the number of projects which can be selected for future funding. Awards will be considered for a fixed performance period of four years, with out-year support contingent on the availability of funds, progress of the research, and programmatic needs. OFES reserves the right not to fund any renewal or new work that is judged not to be

better than or equal in quality and programmatic importance to existing projects within the program. The cost-effectiveness of the application will be considered when comparing applications with differing funding requirements.

## **Collaboration**

Collaborative research projects involving more than one institution are encouraged. Applications submitted from different institutions, which are directed at a common research activity, should **clearly indicate that they are part of a proposed collaboration** and should contain a brief description of the overall research project. However, each application must have a distinct scope of work and a qualified principal investigator, who is responsible for the research effort being performed at his or her institution. Synergistic collaborations with researchers in federal laboratories and Federally Funded Research and Development Centers (FFRDCs), including the DOE National Laboratories, are also encouraged, though no funds will be provided to these organizations under this Notice. A separate Laboratory solicitation will be posted (**Program Announcement LAB 05-09**). Further information on preparation of collaborative applications may be accessed via the Internet at: <http://www.science.doe.gov/grants/Colab.html>.

## **Merit Review**

Projects subject to this special review (i.e. those with annual funding in the range of \$1M per year or greater) will be assessed on how well they are able to contribute to improved understanding of magnetic plasma confinement, in addition to, or as an alternative to presenting an innovative approach to practical fusion energy over the longer term. Against this broad objective, applications will be subjected to a 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 (<http://www.science.doe.gov/grants/605index.html>). Included with each criterion are the detailed questions that are asked of the reviewers. A two-step review is envisaged. All the applications are subjected first to a mail review consisting of three or more peer reviewers per application. Selected applications are further subjected to a panel review. It is planned to have the mail review completed by October 12, 2005. During the mail review, opportunity will be provided to the applicants for rebuttal. A panel review is planned for the week beginning October 31, 2005. (Note - 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 will often be used, and submission of an application constitutes agreement that this proposed review process is acceptable to the investigators and the submitting institution.)

### 1. Scientific and/or technical merit of the project:

- Does this application address one or more important problems in magnetic confinement fusion science and/or represent an innovative approach to practical fusion energy over the longer term?
- How does the proposed research compare with other research in its field, in terms of both scientific and/or technical merit and originality?
- What is the likelihood that the proposed research will lead to new or fundamental advances in its field?

2. Appropriateness of the proposed method or approach:

- Are the conceptual framework, methods, and analyses adequately developed and likely to lead to scientifically valid conclusions?
- Are there significant potential problems and how well does the applicant address these problems?

3. Competency of the applicant's personnel and adequacy of the proposed resources:

- How well qualified are the applicant's personnel to carry out the proposed research? (If appropriate, please comment on the scientific reputation and quality of recent research by the principal investigator and other key personnel.)
- Are the applicant's research environment and resources adequate?
- Does the proposed work take advantage of unique facilities and capabilities and/or make good use of collaborative arrangements?

4. Reasonableness and appropriateness of the proposed budget.

The reviewers are also asked to comment on **Other Appropriate Factors:**

- Could the proposed research make a significant contribution to another field? If so, what field or fields?
- Is there potential for spin-offs? If so, what are some potential spin-offs?
- If applicable, please comment on the educational benefits of the proposed activity.

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 the program areas and within the program areas, coupling to the theory and computational efforts, and quality of previous performance. 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. Funding under this Notice is limited to supporting research activities based in the U.S., though subcontracts with limited funding for collaborators outside the U.S. may be allowed with appropriate justifications.

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

Martin Rubinstein  
Grants and Contracts Division  
Office of Science

Posted on the Office of Science Grants and Contracts Web Site  
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