Program Announcement
To DOE National Laboratories
LAB 01-25

Development of Diagnostic Systems for Magnetic Fusion Energy Sciences

The Office of Fusion Energy Sciences (OFES) of the Office of Science (SC), U.S. Department of Energy (DOE), announces its interest in receiving peer-reviewable Field Work Proposals (FWPs) for the development of new measurement capabilities in magnetic fusion plasmas, leading to improved understanding of plasma behavior in fusion experiments. Programs planning to submit FWPs for renewal funding in FY 2002 should submit to this Announcement.

DATES: To permit timely consideration for awards, proposals submitted in response to this Announcement must be received no later than 4:30 p.m., August 1, 2001. Electronic submission of formal proposals will not be accepted.

Those planning to submit a proposal are requested to submit a letter-of-intent by June 28, 2001.
THE DEADLINE FOR THE LETTER-OF-INTENT HAS BEEN EXTENDED TO JULY 27, 2001. [Added June 20, 2001]
THE DEADLINE FOR FORMAL PROPOSALS HAS BEEN EXTENDED TO AUGUST 31, 2001. [Added June 20, 2001]

ADDRESSES: The completed formal FWPs referencing this Announcement should be forwarded to: Mr. John F. Sauter, SC-55 GTN, U.S. Department of Energy, Office of Science, 19901 Germantown Road, Germantown, Maryland 20874-1290, ATTN: Development of Diagnostic Systems for Magnetic Fusion Energy Sciences Experiments, LAB 01-25. The above address must also be used when submitting FWPs by U.S. Postal Service Express, any commercial mail delivery service, or when being hand-carried.

Letters-of-intent referencing this Announcement should be forwarded to: U.S. Department of Energy, Office of Science, Office of Fusion Energy Sciences, SC-55, 19901 Germantown Road, Germantown, Maryland 20874-1290, ATTN: John Sauter. Electronic submission of letters-of-intent is acceptable and should be submitted via e-mail at the following address: john.sauter@science.doe.gov.

The letter of intent should include the title of the proposal, the name, telephone number, and e-mail address of the principal investigator(s), the requested funding, names and institutions of any collaborators, and a one-page abstract. These letters-of-intent will be used to organize and expedite the review process. Failure to submit a letter-of-intent will not negatively prejudice a responsive formal FWP that is submitted in a timely manner.

FOR FURTHER INFORMATION CONTACT: Darlene Markevich, SC-55 GTN, U.S. Department of Energy, 19901 Germantown Road, Germantown, MD 20874-1290, telephone (301) 903-4920, or by e-mail address, darlene.markevich@science.doe.gov.
Or contact John Sauter, SC-55 GTN, U.S. Department of Energy, 19901 Germantown Road, Germantown, MD 20874-1290, telephone 301-903-3287, or by e-mail address, john.sauter@science.doe.gov.

GENERAL INFORMATION: DOE is under no obligation to pay for any costs associated with the preparation or submission of proposals.

SUPPLEMENTARY INFORMATION: FWPs are sought for the development of new measurement capabilities in a given class of magnetic fusion devices that will lead to improved understanding of plasma behavior in magnetic fusion experiments. The magnetic fusion energy sciences community and OFES must recognize the measurement as necessary for advancing the magnetic fusion energy sciences program. Primary interest for this Announcement is in experimental programs, although it is recognized that part of a coordinated FWP may include theory and modeling in support of experiments. Stand-alone theory FWPs will not be supported. FWPs seeking funding to install and operate a routine diagnostic system will not be considered under this Announcement. It is expected that funds provided to the magnetic fusion experiments should be used to implement routine diagnostics, based on their own research program priorities. Diagnostics for the inertial fusion energy (IFE) program are not included in this Announcement. These are developed and implemented separately under the OFES IFE program.

More detailed information about measurements that are needed for advancing the magnetic fusion program has been prepared by members of the fusion community. This information can be found at the following Web site: http://www.ofes.science.doe.gov/News/DiagDev.html. You may want to periodically check this Web site for any updates or additional information. Please keep in mind that only FWPs that are responsive to the requirements of this Announcement will be considered for funding.

For more general information on the fusion energy sciences program see the OFES Web site at http://www.ofes.science.doe.gov.

FUNDING INFORMATION: Approximately $400,000 of Fiscal Year 2002 funding will be available for awards resulting from this Announcement. The number of awards and range of funding will depend on the number of FWPs received and selected for award. Multi-year funding of FWPs is expected, generally for three years, with funding provided on an annual basis. You are encouraged to submit proposals with three-year project periods, unless the nature of your research requires a project period of less than three years. However, due to the anticipated funding levels for FY02, the initial funding period may be less than twelve months, with two subsequent funding periods of one year each. The project period will be determined by OFES. New projects (i.e., research that is not considered a renewal of a currently funded FWP) selected for award may have a funding start date in FY 2003.

Because future year funding is not anticipated to increase, FWPs should propose constant year effort (allowing for inflation). Future year funding will depend upon suitable progress and the availability of funds. Because of the total amount of available funding and the intent to have a broadly based program, FWPs with an annual requirement in any year in excess of $400,000 are less likely to be funded. The cost-effectiveness of the FWP will be considered when comparing FWPs with differing funding requirements. In cases where the proposed work assumes the availability of a facility, experimental apparatus, or base group to perform the work, the funding source(s) for these additional needs must be identified in the FWP.

A parallel request for grant proposals will appear in the Federal Register. All proposed programs will be evaluated using the same criteria regardless of the submitting institution.

COLLABORATION: Those proposing are encouraged to collaborate with researchers in other institutions, such as universities, industry, non-profit organizations, federal laboratories, and Federally Funded Research and Development Centers (FFRDCs), including the DOE National Laboratories. In the case of collaborative FWPs submitted from different institutions, which are directed at a single research activity, each proposal 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. Further information on preparation of collaborative proposals may be accessed via the Internet at http://www.science.doe.gov/production/grants/Colab.html.

PROPOSAL SUBMISSION: In order to enable the reviewers to read multiple FWPs, the technical discussion of the research in the FWP must be limited to a

maximum of twenty-five (25) pages (not including figures). If you include a progress report for a renewal FWP, it will not be considered part of the page limit. Although it is not required, due to the anticipated number of reviewers, it would be helpful if proposers submitted fifteen (15) copies of their FWP; otherwise, an original and seven copies of each FWP must be submitted.

The FWP should include the name, telephone number, and e-mail address of the principal investigator(s).

The detailed description of the proposed research should contain the following items:

(1) A succinct statement of the goal of the research;
(2) A detailed research plan;
(3) The specific results or deliverables expected at the end of the project period;
(4) A detailed analysis of the adequacy of the facilities and budget;
(5) Evidence of the ability of the diagnostic system to make the proposed measurement;
(6) Discussion of how the research would lead to an improved understanding of plasma behavior in magnetic fusion devices;
(7) Discussion of why this research would have an important impact on the magnetic fusion science program;
(8) Discussion of the aspect of the proposed research that is developmental, as opposed to implementation of an existing measurement technique; and
(9) In cases where the proposed work assumes the availability of a facility, experimental apparatus, or base group to perform the work, include a letter of support from the principal investigator (or other appropriate person) of that facility or group. This letter should specify any technical, engineering, theory/modeling, etc. assistance that will be provided by that facility or group.

All specific instructions above supersede those outlined below in the Guide for Preparation of Scientific/Technical Proposals to be Submitted by National Laboratories. The instructions and format described below should be followed where the subject has not already been specifically addressed in the Announcement above. Reference Program Announcement LAB 01-25 on all submissions and inquiries about this program.

OFFICE OF SCIENCE
GUIDE FOR PREPARATION OF
SCIENTIFIC/TECHNICAL PROPOSALS
TO BE SUBMITTED BY NATIONAL LABORATORIES

Proposals from National Laboratories submitted to the Office of Science (SC) as a result of this program announcement will follow the Department of Energy Field

Work Proposal process with additional information requested to allow for scientific/technical merit review. The following guidelines for content and format are intended to facilitate an understanding of the requirements necessary for SC to conduct a merit review of a proposal. Please follow the guidelines carefully, as deviations could be cause for declination of a proposal without merit review.

1. Evaluation Criteria
Proposals will be subjected to formal merit review (peer review) and will be evaluated against the following criteria which are listed in descending order of importance:

- Scientific and/or technical merit of the project
- Appropriateness of the proposed method or approach
- Competency of the personnel and adequacy of the proposed resources
- Reasonableness and appropriateness of the proposed budget

The evaluation will include program policy factors such as the relevance of the proposed research to the terms of the announcement, the uniqueness of the proposer's capabilities, and demonstrated usefulness of the research for proposals in other DOE Program Offices as evidenced by a history of programmatic support directly related to the proposed work.

2. Summary of Proposal Contents
Field Work Proposal Format (Reference DOE Order 5700.7C) (DOE ONLY)

- Proposal Cover Page
- Table of Contents
- Abstract
- Narrative
- Literature Cited
- Budget and Budget Explanation
- Other support of investigators
- Biographical Sketches
- Description of facilities and resources
- Appendix

2.1 Number of Copies to Submit
An original and seven copies of the formal proposal/FWP must be submitted.

3. Detailed Contents of the Proposal
Proposals must be readily legible, when photocopied, and must conform to the following three requirements: the height of the letters must be no smaller than 10 point with at least 2 points of spacing between lines (leading); the type density must

average no more than 17 characters per inch; the margins must be at least one-half inch on all sides. Figures, charts, tables, figure legends, etc., may include type smaller than these requirements so long as they are still fully legible.

3.1 Field Work Proposal Format (Reference DOE Order 5700.7C) (DOE ONLY)
The Field Work Proposal (FWP) is to be prepared and submitted consistent with policies of the investigator's laboratory and the local DOE Operations Office. Additional information is also requested to allow for scientific/technical merit review. Laboratories may submit proposals directly to the SC Program office listed above. A copy should also be provided to the appropriate DOE operations office.

3.2 Proposal Cover Page
The following proposal cover page information may be placed on plain paper. No form is required.

- Title of proposed project
- SC Program announcement title
- Name of laboratory
- Name of principal investigator (PI)
- Position title of PI
- Mailing address of PI
- Telephone of PI
- Fax number of PI
- Electronic mail address of PI
- Name of official signing for laboratory*
- Title of official
- Fax number of official
- Telephone of official
- Electronic mail address of official
- Requested funding for each year; total request
- Use of human subjects in proposed project: If activities involving human subjects are not planned at any time during the proposed project period, state "No"; otherwise state "Yes", provide the IRB Approval date and Assurance of Compliance Number and include all necessary information with the proposal should human subjects be involved.
- Use of vertebrate animals in proposed project: If activities involving vertebrate animals are not planned at any time during this project, state "No"; otherwise state "Yes" and provide the IACUC Approval date and Animal Welfare Assurance number from NIH and include all necessary information with the proposal.
- Signature of PI, date of signature
- Signature of official, date of signature*

*The signature certifies that personnel and facilities are available as stated in the proposal, if the project is funded.

3.3 Abstract

Provide an abstract of no more than 250 words. Give the broad, long-term objectives and what the specific research proposed is intended to accomplish. State the hypotheses to be tested. Indicate how the proposed research addresses the SC scientific/technical area specifically described in this announcement.

3.4 Narrative

The narrative comprises the research plan for the project and is limited to 25 pages. It should contain the following subsections:

Background and Significance:

Briefly sketch the background leading to the present proposal, critically evaluate existing knowledge, and specifically identify the gaps which the project is intended to fill. State concisely the importance of the research described in the proposal. Explain the relevance of the project to the research needs identified by the Office of Science. Include references to relevant published literature, both to work of the investigators and to work done by other researchers.

Preliminary Studies:

Use this section to provide an account of any preliminary studies that may be pertinent to the proposal. Include any other information that will help to establish the experience and competence of the investigators to pursue the proposed project. References to appropriate publications and manuscripts submitted or accepted for publication may be included.

Research Design and Methods:

Describe the research design and the procedures to be used to accomplish the specific aims of the project. Describe new techniques and methodologies and explain the advantages over existing techniques and methodologies. As part of this section, provide a tentative sequence or timetable for the project.

Subcontract or Consortium Arrangements:

If any portion of the project described under "Research Design and Methods" is to be done in collaboration with another institution, provide information on the institution and why it is to do the specific component of the project. Further information on any such arrangements is to be given in the sections "Budget and Budget Explanation", "Biographical Sketches", and "Description of Facilities and Resources".

3.5 Literature Cited

List all references cited in the narrative. Limit citations to current literature relevant to the proposed research. Information about each reference should be sufficient for it to be located by a reviewer of the proposal.

3.6 Budget and Budget Explanation

A detailed budget is required for the entire project period, which normally will be three years, and for each fiscal year. It is preferred that DOE's budget page, Form 4620.1 be used for providing budget information*. Modifications of categories are permissible to comply with institutional practices, for example with regard to overhead costs.

A written justification of each budget item is to follow the budget pages. For personnel this should take the form of a one-sentence statement of the role of the person in the project. Provide a detailed justification of the need for each item of permanent equipment. Explain each of the other direct costs in sufficient detail for reviewers to be able to judge the appropriateness of the amount requested. Further instructions regarding the budget are given in section 4 of this guide.

* Form 4620.1 is available at web site:
http://www.sc.doe.gov/production/grants/forms.html

3.7 Other Support of Investigators

Other support is defined as all financial resources, whether Federal, non-Federal, commercial or institutional, available in direct support of an individual's research endeavors. Information on active and pending other support is required for all senior personnel, including investigators at collaborating institutions to be funded by a subcontract. For each item of other support, give the organization or agency, inclusive dates of the project or proposed project, annual funding, and level of effort devoted to the project.

3.8 Biographical Sketches

This information is required for senior personnel at the laboratory submitting the proposal and at all subcontracting institutions. The biographical sketch is limited to a maximum of two pages for each investigator.

3.9 Description of Facilities and Resources

Describe briefly the facilities to be used for the conduct of the proposed research. Indicate the performance sites and describe pertinent capabilities, including support facilities (such as machine shops) that will be used during the project. List the most important equipment items already available for the project and their pertinent capabilities. Include this information for each subcontracting institution, if any.

3.10 Appendix

Include collated sets of all appendix materials with each copy of the proposal. Do not use the appendix to circumvent the page limitations of the proposal. Information should be included that may not be easily accessible to a reviewer. Reviewers are not required to consider information in the Appendix, only that in the body of the proposal. Reviewers may not have time to read extensive appendix materials with the

same care as they will read the proposal proper. The appendix may contain the following items: up to five publications, manuscripts (accepted for publication), abstracts, patents, or other printed materials directly relevant to this project, but not generally available to the scientific community; and letters from investigators at other institutions stating their agreement to participate in the project (do not include letters of endorsement of the project).

4. Detailed Instructions for the Budget (DOE Form 4620.1 "Budget Page" may be used)

4.1 Salaries and Wages

List the names of the principal investigator and other key personnel and the estimated number of person-months for which DOE funding is requested. Proposers should list the number of postdoctoral associates and other professional positions included in the proposal and indicate the number of full-time-equivalent (FTE) person-months and rate of pay (hourly, monthly or annually). For graduate and undergraduate students and all other personnel categories such as secretarial, clerical, technical, etc., show the total number of people needed in each job title and total salaries needed. Salaries requested must be consistent with the institution's regular practices. The budget explanation should define concisely the role of each position in the overall project.

4.2 Equipment

DOE defines equipment as "an item of tangible personal property that has a useful life of more than two years and an acquisition cost of $5000 or more." Special purpose equipment means equipment which is used only for research, scientific or other technical activities. Items of needed equipment should be individually listed by description and estimated cost, including tax, and adequately justified. Allowable items ordinarily will be limited to scientific equipment that is not already available for the conduct of the work. General purpose office equipment normally will not be considered eligible for support.

4.3 Domestic Travel

The type and extent of travel and its relation to the research should be specified. Funds may be requested for attendance at meetings and conferences, other travel associated with the work and subsistence. In order to qualify for support, attendance at meetings or conferences must enhance the investigator's capability to perform the research, plan extensions of it, or disseminate its results. Consultant's travel costs also may be requested.

4.4 Foreign Travel

Foreign travel is any travel outside Canada and the United States and its territories and

possessions. Foreign travel may be approved only if it is directly related to project objectives.

4.5 Other Direct Costs

The budget should itemize other anticipated direct costs not included under the headings above, including materials and supplies, publication costs, computer services, and consultant services (which are discussed below). Other examples are: aircraft rental, space rental at research establishments away from the institution, minor building alterations, service charges, and fabrication of equipment or systems not available off-the-shelf. Reference books and periodicals may be charged to the project only if they are specifically related to the research.

a. Materials and Supplies

The budget should indicate in general terms the type of required expendable materials and supplies with their estimated costs. The breakdown should be more detailed when the cost is substantial.

b. Publication Costs/Page Charges

The budget may request funds for the costs of preparing and publishing the results of research, including costs of reports, reprints page charges, or other journal costs (except costs for prior or early publication), and necessary illustrations.

c. Consultant Services

Anticipated consultant services should be justified and information furnished on each individual's expertise, primary organizational affiliation, daily compensation rate and number of days expected service. Consultant's travel costs should be listed separately under travel in the budget.

d. Computer Services

The cost of computer services, including computer-based retrieval of scientific and technical information, may be requested. A justification based on the established computer service rates should be included.

e. Subcontracts

Subcontracts should be listed so that they can be properly evaluated. There should be an anticipated cost and an explanation of that cost for each subcontract. The total amount of each subcontract should also appear as a budget item.

4.6 Indirect Costs

Explain the basis for each overhead and indirect cost. Include the current rates.