

It is anticipated that approximately \$5 million will be available for multiple awards to be made in late FY 2000 and early FY 2001 in the categories described above, contingent on availability of appropriated funds. Applications may request project support up to three years, with out-year support contingent on availability of funds, progress of the research and programmatic needs. Annual budgets for projects in the five scientific research element projects are expected to range from \$100,000 to \$400,000 total costs. Annual budgets for interdisciplinary field research projects at the proposed FRC are expected to range from \$300,000–\$1,000,000 for total costs. Costs for drilling at the proposed FRC should not be included in the applicant's budget. DOE may encourage collaboration among prospective investigators to promote joint applications or joint research projects by using information obtained through the preliminary applications or through other forms of communication.

Applications will be subjected to formal merit review (peer review) and will be evaluated against the following evaluation criteria which are listed in descending order of importance codified at 10 CFR 605.10(d):

1. Scientific and/or Technical Merit of the Project;
2. Appropriateness of the Proposed Method or Approach;
3. Competency of Applicant's personnel and Adequacy of Proposed Resources;
4. Reasonableness and Appropriateness of the Proposed Budget.

Also, as part of the evaluation, program policy factors become a selection priority. Note, external peer reviewers are selected with regard to both their scientific expertise and the absence of conflict-of-interest issues. Non-federal reviewers will often be used, and submission of an application constitutes agreement that this is acceptable to the investigator(s) and the submitting institution.

Information about the development, submission of applications, eligibility, limitations, evaluation, the selection process, and other policies and procedures may be found in 10 CFR Part 605, and in the Application Guide for the Office of Science Financial Assistance Program. Electronic access to SC's Financial Assistance Application Guide is possible via the World Wide Web at: <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 applications if an award

is not made. In addition, for this notice, the research description must be 20 pages or less, exclusive of attachments, and must contain an abstract or summary of the proposed research (to include the hypotheses being tested, the proposed experimental design, and the names of all investigators and their affiliations). Attachments should include short curriculum vitae, QA/QC plan, a listing of all current and pending federal support and letters of intent when collaborations are part of the proposed research. Curriculum vitae should be submitted in a form similar to that of NIH or NSF (two to three pages), see for example: <http://www.nsf.gov:80/bfa/cpo/gpg/fkit.htm#forms-9>.

The Office of Science as part of its grant regulations requires at 10 CFR 605.11(b) that a recipient receiving a grant and performing research involving recombinant DNA molecules and/or organisms and viruses containing recombinant DNA molecules shall comply with the National Institutes of Health (NIH) "Guidelines for Research Involving Recombinant DNA Molecules," which is available via the world wide web at: <http://www.niehs.nih.gov/odhsb/biosafe/nih/rdna-apr98.pdf>, (59 FR 34496, July 5, 1994,) or such later revision of those guidelines as may be published in the **Federal Register**.

Grantees must also comply with other federal and state laws and regulations as appropriate, for example, the Toxic Substances Control Act (TSCA) as it applies to genetically modified organisms. Although compliance with NEPA is the responsibility of DOE, grantees proposing to conduct field research are expected to provide information necessary for the DOE to complete the NEPA review and documentation.

Additional information on the NABIR Program is available at the following web site: <http://www.lbl.gov/NABIR/>. For researchers who do not have access to the world wide web, please contact Karen Carlson; Environmental Sciences Division, SC-74; U.S. Department of Energy; 19901 Germantown Road; Germantown, MD 20874-1290; phone: (301) 903-3338; fax: (301) 903-8519; E-mail: karen.carlson@science.doe.gov; for hard copies of background material mentioned in this solicitation.

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

Issued in Washington, DC on December 15, 1999.

John Rodney Clark,

Associate Director of Science for Resource Management.

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DEPARTMENT OF ENERGY

Office of Science Financial Assistance Program Notice 00-07: New Programs in Fusion Energy Sciences

AGENCY: Department of Energy (DOE).

ACTION: Notice inviting grant applications.

SUMMARY: The Office of Fusion Energy Sciences (OFES) of the Office of Science, U.S. Department of Energy (DOE) announces its interest in receiving grant applications for new research in fusion energy sciences. Programs planning to submit applications for renewal or continuation funding in FY 2000 should not submit to this Notice, but rather submit according to the procedures outlined in 10 CFR part 605.

The specific areas of interest are:

1. Magnetic Fusion Concept Exploration Experiments;
2. Inertial Fusion Energy Concept Exploration Research;
3. Inertial Fusion Energy Chamber and Target Research;
4. Magnetic Fusion Liquid Wall Experiments;
5. Fusion Materials Modeling.

More specific information on each area of interest is outlined in the general and program specific supplementary information sections below. Each grant application can be submitted to only one area of interest. Applicants must identify the area of interest in their formal submission.

DATES: To permit timely consideration for awards in Fiscal Year 2000, applications submitted in response to this notice must be received no later than 4:30 p.m., February 29, 2000. Electronic submissions of formal applications will not be accepted.

Applicants are requested to submit a letter-of-intent by January 31, 2000, which includes the title of the proposal, 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 manner. Electronic submissions of letters-of-intent are acceptable.

ADDRESSES: The completed formal applications referencing Program Notice 00-07 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 00-07. 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.

Letters-of-intent referencing Program Notice 00-07 should be forwarded to: U.S. Department of Energy, Office of Science, Office of Fusion Energy Sciences, SC-50, 19901 Germantown Road, Germantown, Maryland 20874-1290, ATTN: John Sauter. Letters-of-intent can also be submitted via E-mail at the following E-mail address: john.sauter@science.doe.gov

FOR FURTHER INFORMATION CONTACT: Office of Fusion Energy Sciences, U.S. Department of Energy, 19901 Germantown Road, Germantown, MD 20874-1290. Specific contacts for each area of interest, along with telephone numbers and Internet addresses, are listed below:

Magnetic Fusion Concept Exploration Experiments: Ronald A. Blanken, Research Division, SC-55; Telephone: (301) 903-3306 or 4095, or by Internet address, ronald.blanken@science.doe.gov.

Inertial Fusion Energy Concept Exploration Research: Ronald McKnight, Research Division, SC-55; Telephone: (301) 903-4597 or 4095, or by Internet address, ronald.mcknight@science.doe.gov.

Inertial Fusion Energy Chamber and Target Research: Gene Nardella, Facilities and Enabling Technologies Division, SC-52; Telephone: (301) 903-4956 or 3068, or by Internet address, gene.nardella@science.doe.gov.

Magnetic Fusion Liquid Wall Experiments: Sam Berk, Facilities and Enabling Technologies Division, SC-52; Telephone: (301) 903-4171 or 3068, or by Internet address, sam.berk@science.doe.gov

Fusion Materials Modeling: Bill Wiffen, Facilities and Enabling Technologies Division, SC-52; Telephone: (301) 903-4963 or 3068, or by Internet address, fw.wiffen@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 (SC) 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 applications if an award is not made.

Approximately \$1,900,000 of Fiscal Year 2000 funding divided by program element as outlined below 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. Since future year funding is not anticipated to increase, applications should propose constant year effort (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. Applications requiring annual funding as low as \$50,000 are welcomed and encouraged.

New research is herein defined as research which is not within the scope of work of existing programs. In cases where the new work assumes the availability of a facility, experimental apparatus or base group to perform the work, the funding source(s) for the base must be identified in the grant application.

Applicants 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. A parallel announcement for DOE National Laboratories for some of the areas of interest will be available on the Office of Science Grants and Contracts Web Site. In the case of collaborative applications submitted from different institutions which are directed at a single research activity, 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. Further information on preparation of collaborative proposals may be accessed via the Internet at <http://www.sc.doe.gov/production/grants/Colab.html>.

To enable all reviewers in each category to read all applications in that category, the application must be limited to a maximum of twenty (20)

pages (including text and figures) plus no more than one page each of biographical information and publications of the principal investigator. Although it is not required, it would be helpful for each applicant to submit fifteen (15) copies of their application due to the anticipated number of reviewers; otherwise the standard number of copies must be received with each application as outlined in the Application Guide.

In selecting applications for funding, the DOE Office of Fusion Energy Sciences will give priority to applications that can produce results within the first project period after grant initiation (typically three years but as many as five years in the case of grants where construction of complex experimental apparatus is required). The detailed description of the proposed research in addition to the information required by 10 CFR part 605 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) Discussion of how the research would elucidate the physics or engineering principles of the innovation, and (6) Discussion of why this research would have an important impact on the prospects for either magnetic or inertial fusion.

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.

Program Specific Information

Magnetic Fusion Concept Exploration Experiments

Grant applications are desired for new innovative scientific experiments that have the possibility of leading to improved magnetic fusion systems (this includes tokamak based systems with improved performance). The research should be aimed at experimentally elucidating the physics principles of such improved systems. Experiments are sought which are unique, first of a kind and which provide new insights.

These funds are targeted toward the establishment of new experiments and are not meant to support collaborations on existing concept exploration or proof-of-principle experiments. Applications for research on existing large tokamaks, independent theory investigations and new diagnostic development should not be submitted in response to this notice. Applications for new programs based on the replacement of the cores of existing experimental facilities with cores designed to study new physics ideas are allowed. Approximately \$600,000 of FY 2000 funding, depending on the quality of the applications, is targeted for applications received in this area.

Inertial Fusion Energy Concept Exploration Research

Grant applications are desired for new concept exploration scientific research that has the possibility of leading to improved inertial fusion energy systems. Such research may include, for example, expanding the scientific basis for concepts which could lead to significant increases in performance for more developed approaches. Efforts directed toward providing advances in physics understanding of problem areas, which have potentially high impact on inertial fusion energy science, are also of interest. Primary interest is in experimental programs, although it is recognized that part of a coordinated application may include theory and modeling in support of experiments. It is not anticipated that stand-alone theory applications will be supported. Approximately \$400,000 of FY 2000 funding, depending on the quality of the applications, is targeted for applications received in this area.

Inertial Fusion Energy Chamber and Target Research

Grant applications are desired for new innovative research that will address the key critical issues in the chamber systems, target technology, and safety and environmental areas for both heavy ion and laser driven inertial fusion energy systems. Examples of critical issues in the chamber systems area for heavy ion drivers are liquid chamber clearing and final focus/chamber interface. Examples of critical issues in the chamber systems area for laser drivers are chamber material lifetime uncertainty and final optics design and survivability. Examples of critical issues in the target technology area are low-cost, high production rate target fabrication and accurate injection and tracking. Examples of critical issues in the safety and environmental area are minimization of accident consequences

and management of radioactive materials. The examples identified are not an inclusive list. This research can be either experimental and/or analytical in nature. Approximately \$200,000 of FY 2000 funding, depending on the quality of the applications, is targeted for applications received in this area.

Magnetic Fusion Liquid Wall Experiments

Grant applications are sought for innovative experiments that can significantly advance the knowledge base for plasma chamber concepts using liquids in direct contact with plasmas for first walls, divertors, and/or limiters. Research on such liquid wall approaches should be aimed at providing fundamental data and at elucidating dominant phenomena for a more complete scientific understanding of the following key issues: (a) Effects of liquid surfaces on plasma edge and core performance, particularly with regard to influx of particles to the plasma and trapping/pumping of particles from the plasma, (b) effects of liquid surfaces on plasma stability and confinement, particularly with regard to influences from shells and flows of electrically conducting liquids, and (c) limits of power handling and operating temperature for candidate liquid coolants, particularly with regard to turbulence and MHD considerations in free surface flow thermal-hydraulics. Proposed experiments must be accompanied by supporting analysis and modeling activities that provide for an ability to interpret experimental data and support development of computational tools for predicting liquid wall behavior under fusion-relevant conditions. Background information about ongoing research related to liquid walls can be obtained through the Internet at the following web sites: <http://www.fusion.ucla.edu/APEX/> and <http://pentium.ep.anl.gov/alps/>. Approximately \$300,000 of FY 2000 funding, depending on the quality of the applications, is targeted for applications received in this area.

Fusion Materials Modeling

Applications are solicited for three-year grants for research on modeling and/or theory that will expand the knowledge base on understanding of the behavior of structural materials in the service environment of fusion systems. In particular, effects of the temperature, neutron flux, stress state, system fluids, dissimilar materials contact, or other components of the environment are of interest. Response to stresses arising from thermal, mechanical or other loading sources can be included.

Material composition, microstructure and/or macrostructure variables may also be relevant to particular modeling approaches. In a broader sense, proposed research should also contribute to advancing the science of the behavior of materials. While the focus must be on the fusion environment, importance of proposed work beyond the interests of fusion should be identified. A particular goal of proposed modeling and/or theoretical research should be to add value to the in-place experimental program of research on materials for fusion systems. Models are desired that can guide and help interpret costly and difficult-to-obtain experimental results and that can be applied to resolving key material feasibility issues. Applications that request funding for experimental work will not be considered. However, close collaboration with the currently in-place fusion and/or other experimental materials programs is expected and encouraged. Critical interfaces with experimental programs should be identified. Background information and definition of specific areas of interest are provided in two documents produced by the fusion materials community and available on the Internet at the Virtual Laboratory for Technology (VLT) web site, located at <http://vlt.ucsd.edu/>. The documents are "A Whitepaper Proposing an Integrated Program of Theoretical, Experimental, and Database Research for the Development of Advanced Fusion Materials" and "Advanced Materials Program", which is Appendix D of the VLT Roadmap. These documents should be used for background and guidance, but should not be considered as establishing absolute boundaries or scope for this solicitation. Relevance of proposed research to fusion materials, especially to the feasibility issues identified in the above two referenced documents, will be considered in the process of selecting grant applications for funding. Approximately \$400,000 of FY 2000 funding, depending on the quality of the applications, is targeted for applications received in this area.

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

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John Rodney Clark,

Associate Director of Science for Resource Management.

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