

# **Program Announcement To DOE National Laboratories LAB 99-16**

## **Atmospheric Radiation Measurement (ARM) Program**

The Office of Biological and Environmental Sciences (OBER) of the Office of Science (SC), U.S. Department of Energy (DOE), hereby announces its interest in receiving proposals to support the experimental and theoretical study of radiation and clouds in conjunction with the Atmospheric Radiation Measurement (ARM) Program as part of the U.S. Global Change Research Program (USGCRP). This announcement requests proposals for awards to support renewals of activities currently funded by DOE under previous Program Announcements issued for the ARM Program. A very limited number of new research efforts may be funded.

New efforts should address one or more of the following within the context of ARM needs and data capabilities:

- Upper tropospheric water vapor concentration and transport.
- Use of ARM data to quantitatively test cloud and radiation parameterizations used in General Circulation Models (GCMs) and Tropical Western Pacific (TWP) Models.
- The statistics of cloud fields and their interaction with atmospheric radiation.
- Research using Single Column Models focussing on proposals of data to improve the models and extrapolate the improvements to GCMs.
- New efforts to develop ice water path and cloud parameter retrievals with focus on ice content.

One of the major scientific objectives of the Environmental Sciences Division is to improve the performance of predictive models of the Earth's climate and to thereby make predictions of the response of the climate system to increasing concentrations of greenhouse gases. The purpose of the ARM Program is to improve the treatment of radiation and clouds in the models used to predict future climate, particularly the General Circulation Models (GCMs). This program is one element of a major effort to improve the quality of current models and to support the development of sets of climate models capable of making regional prediction of climate and climate change. The major component of the ARM Program is an experimental testbed to gather data for the study of models of the terrestrial radiation field, properties of clouds, the full life cycle of clouds, and the incorporation of these process-level models into climate models. This testbed is referred to as the Cloud and Radiation Testbed (CART). The first ARM CART site began operation in calendar year 1992, with instruments spread over an area of approximately 60,000 sq. km., centered on Lamont, Oklahoma. The Tropical Western Pacific (TWP) site will consist initially of island-based suites of instrumentation focused on cloud and radiative properties in the tropical ocean environment. The first and second of the TWP Atmospheric Radiation and Clouds Stations (ARCS) are operating on the island of Manus, Papua New Guinea and on Nauru respectively. Similar instrumentation is gathering data in the vicinity of Point Barrow, on the North Slope of Alaska and an island site near Atkasak will be instrumented to compliment the Point Barrow measurements.

To ensure that the program meets the broadest needs of the research community and the specific needs of the DOE Environmental Sciences Division (ESD), successful proposers will participate as ARM Science Team members along with selected scientists from other ESD programs that relate to the ARM Program. Costs for participation in ARM Science Team meetings and subcommittee meetings should be based on two trips of 1 week each to Washington, DC, and two (2) trips of 3 days each to Chicago, IL.

Successful proposers for renewal or enhancement of previously awarded projects, will demonstrate: (a) continued relevance of their work to the goals of the ARM Program; (b) the quality and relevance of work conducted under previous support to the goals of the ARM Program, including a listing of publications and presentations; and (c) relevant contribution to the development of the ARM program, particularly the design and development of CART facilities, as a result of previous funding. Renewal proposals should include a special section covering items (b) and (c) entitled "Accomplishments Under Previous Support."

Successful proposers for new awards will demonstrate the role of their research in the improvement of General Circulation Models and/or related models and delineate the path that their results will take to make those improvements. Successful proposers will be involved in one or more of four activities: (a) the development of models and parameterization of radiative transfer or cloud processes, including aerosol effects, or the testing of these models in GCMs or process-level models; (b) experimental studies at CART facilities to test elements of models and their performance; (c) experimental studies to obtain key laboratory data; or (d) the analysis of existing data, including field data and satellite data, to support model development or testing.

The efforts proposed should have as a focus the conduct of research using the CART facilities either in operation or being developed for ARM. Successful proposers will participate in the continuing development of the detailed experimental approaches for CART and guide the evolving development and acquisition of the experimental equipment.

### **Program Funding**

It is anticipated that approximately \$1,000,000 will be available for multiple awards for this activity in FY 2000, contingent upon availability of appropriated funds. Multiple year funding of awards is expected, also contingent upon availability of funds. The allocation of funds will depend on the number and quality of the proposals received. It is anticipated that most of the funds will support renewals of existing research. Typical ESD awards are \$200,000 per year, but range from \$50,000 to \$600,000.

Collaborative proposals are encouraged. Awards are anticipated to begin on or about November 1, 1999.

Proposals for renewal of ongoing efforts must include an "Accomplishments under Previous Support" section, which should not exceed ten (10) additional double-spaced pages. The technical portion of the proposal should not exceed twenty-five (25) doubled-spaced pages. An abstract of less than 200 words must be included with the proposal. Lengthy appendices are discouraged.

Technical information on the ARM Program is available from the ARM Program Office at Pacific Northwest Laboratory, P.O. Box 999, Richland, WA 99352 (telephone (509) 375-6964).

**DATES:** Proposers are strongly encouraged to submit a two page (maximum) brief preproposal. All preproposals, referencing Program Announcement LAB99-16, should be received by DOE by 4:30 P.M., E.D.T., April 12, 1999. A response to the preproposals discussing the potential program relevance and generally encouraging or discouraging a formal proposal will be communicated to the proposer by April 19, 1999.

The deadline for receipt of formal proposals is 4:30 P.M., E.D.T., June 7, 1999, in order to be accepted for merit review and to permit timely consideration for award in Fiscal Year 2000.

**ADDRESSES:** Preproposals referencing Program Announcement LAB99-16, should be sent by E-mail to p.crowley@science.doe.gov. Preproposals will also be accepted if mailed to the following address: Dr. Patrick Crowley, Office of Biological and Environmental Research, SC-74, U.S. Department of Energy, 19901 Germantown Road, Germantown, MD 20874-1290.

Formal proposals, referencing Program Announcement LAB99-16, should be sent to: U.S. Department of Energy, Office of Science, Office of Biological and Environmental Research, SC-74, 19901 Germantown Road, Germantown, MD 20874-1290, ATTN: Program Announcement LAB99-16. This address must be used when submitting proposals by U.S. Postal Service Express Mail or any other commercial mail delivery service, or when hand-carried by the proposer.

**FOR FURTHER INFORMATION CONTACT:** Dr. Patrick Crowley, preferably by e-mail p.crowley@science.doe.gov, otherwise by telephone: (301) 903-3069, or at the Office of Biological and Environmental Research, SC-74, U.S. Department of Energy, 19901 Germantown Road, Germantown, MD 20874-1290.

The instructions and format described below should be followed. Reference Program Announcement LAB99-16 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 Table of Contents**

Provide the initial page number for each of the sections of the proposal. Number pages consecutively at the bottom of each page throughout the proposal. Start each major section at the top of a new page. Do not use unnumbered pages and do not use suffices, such as 5a, 5b.

### **3.4 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.

### **3.5 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".

### **3.6 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.

### **3.7 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.er.doe.gov/production/grants/forms.html>

### **3.8 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.

### **3.9 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.

### **3.10 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.

### **3.11 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.