

**Program Announcement
To DOE National Laboratories
LAB 02-07**

Atmospheric Radiation Measurement Program

The Office of Biological and Environmental Research (OBER) of the Office of Science (SC), U.S. Department of Energy (DOE), hereby announces its interest in receiving proposals for experimental and theoretical studies 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 notice requests new proposals and renewal proposals of research currently funded by DOE under previous ARM Program announcements that are relevant to the terms of reference for this announcement and responsive to the particular needs defined below.

Background: Atmospheric Radiation Measurement (ARM) Program.

Two of the major scientific objectives of the Environmental Sciences Division (ESD) are 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 particularly the General Circulation Models (GCMs) used to predict future climate. This program is one component of a major interagency effort to improve the quality of current models and to support the development of sets of climate models capable of simulating and predicting 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 facility is referred to as the Cloud and Radiation Testbed (CART).

The ARM program has established CART sites in three climatic regimes. The first site, Southern Great Plains (SGP), began operation in calendar year 1992, with instruments spread over an area of approximately 60,000 sq. km., centered on Lamont, Oklahoma. The second site, the Tropical Western Pacific (TWP), is the area roughly between 10oN to 10oS of the equator from Indonesia to near Christmas Island. This region of the world plays a large role in the interannual variability observed in the global climate system. The first and second of the TWP Atmospheric Radiation and Clouds Stations (ARCS) are operating on the islands of Manus, Papua, New Guinea and the Republic of Nauru respectively, and a third station at Darwin,

Australia will be operational in early 2002. Similar instrumentation is gathering data in the vicinity of Point Barrow, on the North Slope of Alaska (NSA) and an inland site near Atqasak. Program information is available on the DOE/OBER WWW site using the URL: <http://www.sc.doe.gov/production/OBER/GC/arm.html>.

Request for Proposals

This announcement requests proposals for awards, both new and renewals that address the broad ARM goal of improving cloud and radiation parameterizations in climate models.

Successful researchers for renewal of previously funded awards, shall demonstrate: (a) continued relevance of their work to the goals of the ARM Program; (b) the contribution 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 ARM facilities, as a result of previous funding. Renewal proposals should include a special section covering items (b) and (c) entitled "Accomplishments Under Previous Support."

Proposals are requested in one or more of the following three areas: (a) the development of models and parameterization of radiative transfer or cloud processes, including aerosol effects, or the testing of these models in climate GCMs or in process-level models; (b) experimental studies at ARM facilities to test elements of process-level models and their performance; or (c) the analysis of existing data, including field data and satellite data, to support model development or testing. Researchers should specifically describe the role of their proposed research in the improvement of climate GCMs and/or related models and delineate the path that their results will take to make those improvements.

The efforts proposed must have as a focus the conduct of research using the ARM data streams or ARM sites. Successful researchers for research on either parameterization development and evaluation or data assimilation will be encouraged to cooperate with the Initial Tendency Error Analysis (<http://www-pcmdi.llnl.gov/itea/>) effort at DOE's Program for Climate Model Diagnosis and Intercomparison (PCMDI). Successful researchers will participate in the continuing development of the detailed experimental approaches for the ARM.

Efforts that request funding to support the development of an instrument or to prove the scientific utility of an instrument will not be considered.

Specific areas of interest to the ARM Program include, but are not limited to:

- Use of ARM data to test quantitatively cloud and radiation parameterizations used in GCMs
- Development of new cloud and radiation parameterizations
- Determination of the concentration and advection of cloud water and ice on the regional scale
- Statistics of cloud fields and their interaction with atmospheric radiation
- Realistic retrievals of the 3D structure of clouds on scales of 10 to 100 km
- Retrieval of ice water path and ice cloud microphysics using remote sensing measurements from the ground or ground and satellite
- Calculation of heating rate profiles in realistic cloud fields
- Climatological properties of aerosols over the SGP site using ARM data
- Combining ground-based and satellite remote sensing data to provide improved characterization of the atmospheric column above and surrounding the ARM sites, particularly at the remote sites in the TWP and NSA

To ensure that the program meets the broadest needs of the research community and the specific needs of the DOE ESD, successful applicants are expected to participate as ARM Science Team members in the appropriate working group(s) relevant to their efforts. 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 trips of 3 days each to Chicago, Illinois.

DATES: Researchers are encouraged (but not required) to submit a brief preapplication for programmatic review. The deadline for submission of preproposals is March 15, 2002. Early submission of preproposals is encouraged to allow time for meaningful responses.

Formal proposals submitted in response to this notice must be received by 4:30 p.m., E.D.T., April 11, 2002, to be accepted for merit review and to permit timely consideration for award in Fiscal Year 2003.

ADDRESSES: Preproposals referencing Program Announcement LAB 02-07 may be sent to the program contact, Dr. Wanda Ferrell, via electronic mail at: wanda.ferrell@science.doe.gov or by U. S. Postal Service Mail at: Office of Biological and Environmental Research, Dr. Wanda Ferrell, Environmental Sciences Division, SC-74, U.S. Department of Energy, 19901 Germantown Road, Germantown, MD 20874-1290. Electronic mail is recommended to speed up response to preproposals.

Formal proposals referencing Program Announcement LAB 02-07 should be forwarded to: U.S. Department of Energy, Office of Science, Office of Biological and Environmental Research, Environmental Sciences Division, SC-74, 19901

Germantown Road, Germantown, MD 20874- 1290, ATTN: Program Announcement LAB 02-07. This address also must be used when submitting proposals by U.S. Postal Service Express Mail, any commercial mail delivery service, or when hand-carried by the applicant. An original and seven copies of the application must be submitted; however, applicants are requested not to submit multiple application copies using more than one delivery or mail service.

FOR FURTHER INFORMATION CONTACT: Dr. Wanda Ferrell, Office of Biological and Environmental Research, Environmental Sciences Division, SC-74, U.S. Department of Energy, 19901 Germantown Road, Germantown, MD 20874-1290, telephone (301) 903-0043, fax (301) 903-8519, Internet e-mail address: wanda.ferrell@science.doe.gov.

Program Funding

It is anticipated that approximately \$1,000,000 will be available for awards in Fiscal Year 2003, contingent upon the availability of appropriated funds. Multiple year funding of awards is expected, with out-year funding also contingent upon the availability of appropriated funds, progress of the research, and programmatic needs. The allocation of funds within the research areas will depend upon the number and quality of proposals received.

Collaboration

Proposers are strongly 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, where appropriate, and to include cost sharing wherever feasible. Additional information on collaboration is available in the Application Guide for the Office of Science Financial Assistance Program that is available via the World Wide Web at: <http://www.sc.doe.gov/production/grants/Colab.html>.

Preproposals

Potential researchers are strongly encouraged to submit a brief preapplication that consists of two to three pages of narrative describing the research objectives and methods of accomplishment. These will be reviewed relative to the scope and research needs of the ARM Program. Principal Investigator (PI) address, telephone number, fax number and e-mail address are required parts of the preproposals. A response to each preproposal discussing the potential program relevance of a formal proposal generally will be communicated within 15 days of receipt. Use of e-mail for this communication will decrease the possibility of delay in responses to the preproposal.

The deadline for the submission of preproposals is March 15, 2002. Researchers should allow sufficient time so that the formal proposal deadline is met.

Submission Information

The technical portion of the proposal should not exceed twenty-five double-spaced pages and should include detailed budgets for each year of support requested. Awards are expected to begin on or about November 1, 2002. Attachments include curriculum vitae, 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/bfa/cpo/gpg/fkit.htm#forms-9>.

In addition to the original and seven copies of the proposal that must be submitted, the researchers are asked to submit an electronic copy of the abstract in ASCII format to: wanda.ferrell@science.doe.gov. The abstract should include the following information: PI and co-PIs, their institutions, and a brief summary of research.

Technical information on ARM is available on the WWW at the URL: <http://www.arm.gov> and the ARM Program Office at the Pacific Northwest National Laboratory, P.O. Box 999, Richland, Washington 99352, telephone: (509) 375-6964.

The instructions and format described below should be followed. Reference Program Announcement LAB 02-07 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 (FWP) 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.sc.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 \$25,000 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.