

**Office of Energy Research**

**Notice 97-07**

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

Department of Energy  
Office of Energy Research

Energy Research Financial Assistance Program Notice 97-07;  
[Atmospheric Radiation Measurement \(ARM\) Program](#)

AGENCY: U. S. Department of Energy (DOE)

ACTION: Notice inviting grant applications.

SUMMARY: The Office of Health and Environmental Research (OHER) of the Office of Energy Research, U.S. Department of Energy (DOE), hereby announces its interest in receiving applications 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).

DATES: Formal applications submitted in response to this notice must be received by 4:30 PM, EDT, April 29, 1997, to permit timely consideration for award in fiscal year 1998.

ADDRESSES: Formal applications should be forwarded to: U.S. Department of Energy, Office of Energy Research, Grants and Contracts Division, ER-64, 19901 Germantown Road, Germantown, MD 20874-1290, ATTN: Program Notice 97-07. This address also must be used when submitting applications by U.S. Postal Service Express Mail, any commercial mail delivery service, or when handcarried by the applicant.

FOR FURTHER INFORMATION CONTACT: Dr. Patrick A. Crowley, Office of Health and Environmental Research, Environmental Sciences Division, ER-74, U.S. Department of Energy, 19901 Germantown Road, Germantown, MD 20874-1290. Telephone: (301) 903-3069, fax (301) 903-8519, or by Internet e-mail address, [p.crowley@oer.doe.gov](mailto:p.crowley@oer.doe.gov). Program information is available on the ARM WWW page: <http://www.arm.gov>.

SUPPLEMENTARY INFORMATION: This notice requests applications for grants to support the following four efforts:

- 1) Continuation and enhancement of activities previously funded by DOE under the auspices of the ARM program via responses to earlier announcements.
- 2) The modeling of clouds and radiation including aerosol effects for use in General Circulation Models (GCMs) and related models. Analysis of ARM and other data for refining, supporting,

and validating model development are key aspects of research sought in this category. These activities should be closely tied to the analysis and use of data from the current and planned facilities at three Cloud and Radiation Testbed sites: the first is centered near Lamont, Oklahoma; the second has instruments operating on the Island of Manus, Papua, New Guinea, and later will have other sites in the Tropical Western Pacific; and the third site in the North Slope of Alaska region.

3) The extension of fundamental research results or methodology to the development and evaluation of new analytic methods and algorithms that take advantage of ARM data. Methods and algorithms that are proposed to evolve from these efforts must be suitable for automated use in the routine processing of ARM data streams. Successful applications will use data from current or projected ARM instruments (singly, in combination, or in combination with data from outside the ARM program, e.g. Satellite data), to provide new ARM community data streams of high credibility and useability within the ARM Science Team.

4) The development of advanced instrumentation for high accuracy/precision radiometric observations and for profiling of all three phases of water in the atmosphere and lower stratosphere. Short wave radiometry is of particular present interest.

The use of ARM data to support activities in other programs with goals related to those of ARM through non-ARM funded participation in the ARM Science Team is encouraged. Researchers whose activities align with ARM goals and for whom this is a desirable option are encouraged to contact the ARM Program Office.

One of the major scientific objectives of the Environmental Sciences Division (ESD) 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 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 of the TWP Atmospheric Radiation and Clouds Stations (ARCS) is operating on the island of Manus, Papua New Guinea, and the second is planned for Nauru in 1998. Similar instrumentation will be deployed to a North Slope of Alaska site late in 1997.

To ensure that the program meets the broadest needs of the research community and the specific needs of the DOE, ESD, successful applicants 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, D.C., and two trips of 3 days each to Chicago, Illinois.

Successful applicants for continuation or enhancement of previously awarded grants will demonstrate (a) the 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 under previous funding. Applications should include a special section covering items (b) and (c) entitled "Accomplishments Under Previous Support."

Successful applicants for grants in support of modeling of clouds and radiation will demonstrate the role of their research in the improvement of GCMs and/or related models and delineate the path that their results will take to make those improvements. Successful applicants will be involved in one or more of three 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 or to obtain key laboratory data; and/or (c) the analysis of existing data, including field data and satellite data, to support model development or testing.

Successful applicants for participation in the development of new analytic methods and derived data products, will demonstrate how the proposed efforts support the ARM Science Team members involved in the other categories of research. Applications in this area must recognize that the program has a developed infrastructure for data treatment and distribution. The support looked for in this area involves a deeper more sophisticated algorithmic approach than presently in use. The successful applications will accent a strong scientific approach to the problem of data fusion.

Because ARM is well into its intended life cycle, successful applicants for participation in the ARM instrument development program will meet either (1) immediate and near-term needs of the ARM Program for improved radiometric sensors, both broad-band and spectrally resolved or for instruments capable of high-precision radiometric calibration, or (2) immediate and near-term needs of the ARM Program for improved systems for the measurement of the spatial distribution of all three phases of water, with particular emphasis on vertical profiles. In each case the application should contain, in appropriate detail, a discussion of the accuracy and precision of the proposed measurement methodology as a function of wavelength or altitude respectively, and the relevance of the proposed measurements to test models of atmospheric radiative processes. It has been suggested that the data available from the array of instruments planned or in place in the program suffer from too little strongly calibrated short wave data. Applications which address this concern in the near term are anticipated to be of high interest.

Participants in the adjunct ARM Science Team will apply ARM data to research programs of interest to DOE and related to ARM goals, but are funded by other sources. While ARM data is available through the ARM Data Archive at Oak Ridge National Laboratory, ARM Science Team participation provides investigators the opportunity to receive tailored data products from the ARM Experiment Center at Pacific Northwest Laboratory and the opportunity to participate

in the design of ARM facilities and experiments. While there will not be funds to support the research of applicants under this portion of this notice, some funds may be available to support the travel of successful applicants to participate in ARM Science Team activities as indicated below. Research interest and objectives must be strongly related to the general goals of ARM outlined above; Global Energy and Water Experiment (GEWEX) and its associated programs; the study of aerosols and their effect on the radiative transfer, including visibility studies; and the transfer of UV-B radiation through the atmosphere.

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

It is anticipated that approximately \$3,000,000 will be available for awards in fiscal year 1998, contingent upon availability of appropriated funds. Multiple year funding of awards is expected, also contingent upon availability of funds. The allocation of funds within the research areas will depend on the number and quality of the applications received. It is anticipated that a substantial fraction of the funds will support continuation of existing research. Typical ESD awards are \$200,000 per year, but range from \$50,000 to \$600,000. Information about development, submission, and 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 Energy Research Financial Assistance Program. The Application Guide is available from the U.S. Department of Energy, Office of Health and Environmental Research, Environmental Sciences Division, ER-74, 19901 Germantown Road, Germantown, MD 20874-1290. Telephone requests may be made by calling (301) 903-3338. Electronic access to ER's Financial Assistance Guide is possible via the Internet using the following WWW site address: <http://www.er.doe.gov/production/grants/grants.html>.

Collaborative applications are encouraged. Awards are anticipated to begin on or about November 1, 1997.

The technical portion of the application should not exceed twenty-five (25) doubled-spaced pages. For applications requesting continuation or enhancements to previously awarded grants, the "Accomplishments Under Previous Support" section should not exceed ten (10) additional double-spaced pages. An abstract of less than 200 words must be included with the application. 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, or from the Office of Scientific and Technical Information, P.O. Box 62, Oak Ridge, TN 37831, telephone (615) 576-8401.

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

John Rodney Clark  
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for Resource Management  
Office of Energy Research

Published in the Federal Register January 27, 1997, Vol. 62, No. 17, pages 3884-3886.