

**FINANCIAL ASSISTANCE  
FUNDING OPPORTUNITY ANNOUNCEMENT**



**U.S. Department of Energy  
Office of Science  
Office of Biological and Environmental Research**

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

**Funding Opportunity Number: DE-PS02-08ER08-23**

**Announcement Type: Initial**

**CFDA Number: 81.049**

**ISSUE DATE: 4/22/2008**

**Preapplication Due Date: 5/21/2008, 4:30 PM Eastern Time  
(Preapplications are Required)**

**Application Due Date: 7/21/2008, 8:00 PM Eastern Time**

**A change has been made to this Funding Opportunity  
Announcement regarding Eligible Applicants. See page 13. (Posted 5/7/2008)**

## **NOTE: REQUIREMENTS FOR GRANTS.GOV**

**Where to Submit:** Applications must be submitted through Grants.gov to be considered for award. You cannot submit an application through Grants.gov unless you are registered. Please read the registration requirements carefully and start the process immediately. Remember you have to update your CCR registration annually. If you have any questions about your registration, you should contact the Grants.gov Helpdesk at 1-800-518-4726 to verify that you are still registered in Grants.gov.

**Registration Requirements:** There are several one-time actions you must complete in order to submit an application through Grants.gov (e.g., obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number, register with the Central Contract Registry (CCR), register with the credential provider, and register with Grants.gov). See <http://www.grants.gov/GetStarted>. Use the Grants.gov Organization Registration Checklist at <http://www.grants.gov/assets/OrganizationRegCheck.pdf> to guide you through the process. Designating an E-Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in the CCR registration process. Applicants, who are not registered with CCR and Grants.gov, should allow at least 21 days to complete these requirements. It is suggested that the process be started as soon as possible.

**IMPORTANT NOTICE TO POTENTIAL APPLICANTS:** When you have completed the process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e. Grants.gov registration).

**MICROSOFT VISTA AND OFFICE 2007 COMPATIBILITY:** Grants.gov is currently incompatible with both the new Microsoft (MS) Vista Operating System and the new Microsoft (MS) Office 2007 versions of Word, Excel and Power Point. In order to create and submit your application to Grants.gov, you must find a computer with a previous version Microsoft Operating System, such as Windows XP.

If you attach a file created using MS Office 2007, you will not get an error message when you submit the application, HOWEVER your entire application will not be able to be processed or accepted at Grants.gov and will not reach DOE. Grants.gov can accept applications with attachments created in MS Office 2007 if the attachments are saved in the prior format. See [www.grants.gov/www.grants.gov/assets/Vista\\_and\\_office\\_07\\_Compatibility.pdf](http://www.grants.gov/www.grants.gov/assets/Vista_and_office_07_Compatibility.pdf) for detailed instructions on how to do this. A file created in MS Office 2007 can be identified by the "x" at the end of the file extension, for example "sample.docx" for a Word file. Contact Grants.gov at 1-800-518-4726 with any questions.

**Questions:** Questions relating to the registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or [support@grants.gov](mailto:support@grants.gov). Part VII of this announcement explains how to submit other questions to the Department of Energy (DOE).

**Application Receipt Notices:** After an application is submitted, the Authorized Organization Representative (AOR) will receive a series of five e-mails. It is extremely important that the AOR watch for and save each of the e-mails. It may take up to two (2) business days from application submission to receipt of e-mail Number 2. When the AOR receives e-mail Number 5, it is their responsibility to follow the instructions in the e-mail to logon to IIPS and verify that

their application was received by DOE. The titles of the five e-mails are:

Number 1 – Grants.gov Submission Receipt Number

Number 2 – Grants.gov Submission Validation Receipt for Application Number

Number 3 – Grants.gov Grantor Agency Retrieval Receipt for Application Number

Number 4 – Grants.gov Agency Tracking Number Assignment for Application Number

Number 5 – DOE e-Center Grant Application Received

The last e-mail will contain instructions for the AOR to register with the DOE e-Center. If the AOR is already registered with the DOE e-Center, the title of the last e-mail changes to:

Number 5 – DOE e-Center Grant Application Received and Matched

This e-mail will contain the direct link to the application in IIPS. The AOR will need to enter their DOE e-Center user id and password to access the application.

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## **PART I – FUNDING OPPORTUNITY DESCRIPTION**

**GENERAL INQUIRIES ABOUT THIS FOA SHOULD BE DIRECTED TO:**

### **Technical/Scientific Contact:**

Dr. Kiran Alapaty

**Telephone:** (301) 903-3175

**E-mail:** Kiran.Alapaty@science.doe.gov

### **STATUTORY AUTHORITY**

Public Law 95-91, US Department of Energy Organization Act

Public Law 109-58, Energy Policy Act of 2005

### **APPLICABLE REGULATIONS**

U.S. Department of Energy Financial Assistance Rules, codified at 10 CFR Part 600

U.S. Department of Energy, Office of Science Financial Assistance Program Rule, codified at 10 CFR Part 605

### **SUMMARY:**

The Office of Biological and Environmental Research (BER) of the Office of Science (SC), U.S. Department of Energy (DOE), hereby announces its interest in receiving applications to develop innovative methods for observational data analysis and utilize the resulting knowledge from such analyses to improve cloud parameterizations. The intent is to improve the modeling of cloud properties and processes and their impact on the atmospheric radiation balance. If the application is successful, the research would be part of the Atmospheric Radiation Measurement (ARM) Program in the Climate Change Research Division (CCRD). The ARM Program is a part of several DOE programs in the interagency U.S. Climate Change Science Program (CCSP).

### **SUPPLEMENTARY INFORMATION:**

#### **Background:**

The Climate Change Research Division (CCRD) has established the following Long Term Measure (LTM): Deliver improved scientific data and models about the potential response of the Earth's climate and terrestrial biosphere to increased greenhouse gas levels for policy makers to determine safe levels of greenhouse gases in the atmosphere. The ARM goal to improve the treatment of clouds, aerosols, and radiative processes in regional and global climate models used to predict future climate directly addresses the LTM. The ARM program also addresses the U.S. Climate Change Science Program (CCSP) goal to improve the capability to accurately simulate and predict climate and climate change. Thus, the major component of ARM involves gathering and analyzing data for the development and testing of parameterizations for the atmospheric radiation transfer, clouds, and aerosols with the ultimate goal of improving or developing and validating physical parameterizations for regional and global climate models.

The ARM program has been promoting the development of climate data sets from ARM measurements for several atmospheric variables. The ARM Climate Research Facility has established and operates three fixed facilities (the Southern Great Plains (SGP), the Tropical Western Pacific (TWP), and the North Slope of Alaska (NSA)), to collect radiation and cloud data on the climatic regimes represented by each of the three respective site locations. In addition, the ARM program has also developed the ARM Mobile Facility (AMF) to collect cloud and radiation data in several climatic regimes. The ARM Aerial Vehicle Program (AVP) provides aerial measurement platforms that can be used to support experiments at the fixed sites or in conjunction with the mobile facility. The SGP (<http://www.arm.gov/sites/sgp.stm>) was chosen as a field measurement site for several reasons including its relatively homogenous geography, wide variability of climate, cloud type, and surface flux properties, and large seasonal variation in temperature and specific humidity. The second facility, TWP (<http://www.arm.gov/sites/twp.stm>), consists of stations at Darwin, Australia, and on the islands of Manus, Papua, New Guinea and the Republic of Nauru respectively. This region was selected because it plays a large role in the interannual variability observed in the global climate system. The third facility, the NSA (<http://www.arm.gov/sites/nsa.stm>), is located at Barrow, Alaska, with a secondary inland site near Atkasuk. The NSA location was selected because it provides data about cloud and radiative processes at high latitudes, and by extension, about cold and dry regions of the atmosphere in general. The AMF (<http://www.arm.gov/sites/amf.stm>) was developed to collect climate data to address science questions beyond those addressed by the measurements at fixed sites. The AMF is similar to the fixed site facilities in that it contains many of the same instruments and data systems, but is designed to be deployed around the world for campaigns lasting 6-12 months. The data collected from these facilities comprise a climatic observational database.

Upcoming new ARM measurements are from the Indirect and Semi-Direct Aerosol Campaign (ISDAC) and the China deployment. The ISDAC was conducted in April 2008 at the NSA. Measurement systems included a heavily instrumented aircraft that collected data from the sky, while instruments based at surface sites in Barrow and Atkasuk, Alaska, obtained measurements from the ground. Also in 2008, a campaign utilizing the ARM Mobile Facility will begin in China to collect a comprehensive data set that can be used to study the impact of heavy aerosol loading on radiative fluxes, clouds, precipitation, as well as general climate in China and downwind regions. Applicants are encouraged to review the research status of the ARM data analysis and products available at URLs <http://www.arm.gov/data/> and <http://stm.arm.gov/pastmeetings.stm>

Program information is available on <http://www.science.doe.gov/ober/CCRD/arm.html>. Background material on ARM science is available through the ARM Science Plan <http://www.arm.gov/publications/programdocs/doe-er-arm-0402.pdf>

### **Request for Grant Applications:**

All applications submitted in response to this Announcement must explicitly state how the proposed research will support accomplishment of the BER CCRD's LTM of Scientific Advancement: **"Deliver improved scientific data and models about the potential response of the Earth's climate and terrestrial biosphere to increased greenhouse gas levels for policy makers to determine safe levels of greenhouse gases in the atmosphere."**

This Announcement requests applications for grants, both new and renewal, that address the ARM goal of improving the accuracy of regional and global climate model simulations by improving the representation of cloud, aerosol, and radiation processes in these models. The research areas of interest include the development or improvement of algorithms for retrieving the required atmospheric parameters from ARM instruments; studies utilizing ARM data to improve the understanding of cloud, aerosol, and radiation physical processes; and, the translation of process study results to improve or develop parameterizations for the respective processes to improve climate model simulations.

The main theme of this solicitation revolves around clouds and aerosols. For clouds themes of interest include: (a) retrieval of cloud micro and macrophysical properties in the context of long term climate records; (b) analysis of cloud properties and their interactions with atmospheric radiation from a climate perspective; (c) improvement or development of cloud parameterizations suitable for regional and global climate models using the ARM data and other complementary data; and (d) analysis and process modeling studies of cloud impacts on the atmospheric radiation. For aerosols, the theme is analysis and process modeling studies of indirect effects of aerosols on clouds using ARM measurements from ISDAC and the China deployment of the ARM mobile facility as well as other existing ARM data. **Usage of ARM data is mandatory and the usage of additional data from other sources to complement research is strongly encouraged.** The usage of community models both at the regional and global scales is also encouraged. A community model can be defined as a model that has the following attributes: it should (1) be an open-source numerical model; (2) be easily accessible to any user (e.g., via internet); (3) have documentation of the structure and physics; (4) have some level of user support and training; and (5) have user community meetings to promote the exchange of new science among the users. Large-eddy simulation (LES) and cloud resolving models (CRMs) or other limited area models can be used and such models that are based on community regional models are particularly encouraged. Also, applications proposing to use LES and/or CRMs with additional research plans to improve cloud/radiation/aerosol processes' representation in regional and/or global climate models will be given high priority. Additionally, applications dealing with multiple themes identified above, for example, themes (a) and (b); or (b) and (c); or (a) and (b) and (c) will also be given high priority. In that respect, collaborative applications are especially encouraged.

Specific areas of interest to the ARM program follow:

- Improve existing or develop new cloud and radiation parameterizations for regional and global models.
- Improve cumulus convection schemes in global climate models by incorporating mesoscale effects of convection. Community models are encouraged.
- Alternatively, develop a multi-scale cumulus convection parameterization that is applicable to horizontal grid-scales typically used in Mesoscale and Global models. Thus, the new parameterization should be able to: (1) simulate deep convection in a mesoscale model, and (2) represent mesoscale effects of convection when used in a global model.

**Usage of ARM data is mandatory and the usage of additional data from other sources to complement research is strongly encouraged. Additionally, if applicable, usage of relevant**

**data that may be available from other DOE research programs (e.g., Atmospheric Science Program) is also encouraged. Applications for instrument development will not be considered. Applications that require a special field campaign, which has not already been planned and approved by the ARM Climate Research Facility Program Manager, will not be accepted for consideration. For approved campaigns see: (<http://www.db.arm.gov/cgi-bin/IOP/iops.pl>.)**

Applications for research to develop new techniques to retrieve the properties of clouds using ARM data should be targeted on the development of methods for deriving long-term records of cloud microphysical and macrophysical properties at multiple locations. Also, these retrieval techniques must include quantitative uncertainty analysis for estimates of cloud properties. New or improved methods for radiative transfer in cloudy atmospheres, including the overlap problem of cloud layers, are especially encouraged.

Applications for research to develop and test new cloud and radiation process models should highlight scientific advancement over existing models and focus on investigating the validity of assumptions that are associated with such models and how well the ensemble of cloud and radiation submodels simulate clouds and their effect on radiation fields in the climate models. Applicants are strongly encouraged to utilize the tools that have been developed for this purpose in the Climate Change Prediction Program - ARM Parameterization Testbed (CAPT) (<http://www-pcmdi.llnl.gov/projects/capt/>) effort at DOE's Program for Climate Model Diagnosis and Intercomparison (PCMDI).

### **Data Sharing Plans:**

Research data obtained through public funding is a public trust. As such, this data must be publicly accessible. To be in compliance with the data policy of the U.S. Global Change Research Program (now called the U.S. Climate Change Science Program) of full and open access to global change research data, applications submitted in response to this solicitation must include a description of the applicant's data sharing plans if the proposed research involves the acquisition of data in the course of the research that would be of use to the climate change research and assessment communities. This includes data from extensive, long-term observations and experiments and from long-term model simulations of climate that would be costly to duplicate. The description must include plans for sharing the data that is to be acquired in the course of the proposed research, particularly how the acquired data would be preserved, documented, and quality assured, and where it would be archived for access by others. Data of potentially broad use in climate change research and assessments should be archived, when possible, in a central data depository for dissemination, such as in DOE's Carbon Dioxide Information Analysis Center. The central depository where the applicant intends to archive the data should be notified in advance of the intention, contingent on a successful outcome of the application review. If data are to be archived at the applicant's home institution or in some other location besides a central repository, the application must describe how, where, and for how long the data will be documented and archived for access by others. Applicants are allowed an initial period of exclusive use of the acquired data to quality assure it and to publish papers based on the data, but they are strongly encouraged to make the data openly available as soon as possible after this period. The DOE Office of Science defines the exclusive use period to be one year

after the end of the data acquisition period for the proposed performance period of the grant application but exceptions to extend this period may be justified for unique or extenuating circumstances.

### **Participation in ARM Science Team**

To ensure that the program meets the broadest needs of the research community and the specific needs of the DOE CCRD, 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 working group meetings should **not exceed \$4,500 per project year or should be based on two trips of 1 week each to Washington, DC, and two trips of 3 days each to Chicago, Illinois.**

## **PART II – AWARD INFORMATION**

### **A. TYPE OF AWARD INSTRUMENT.**

DOE anticipates awarding grants under this program announcement.

### **B. ESTIMATED FUNDING.**

It is anticipated that approximately \$3,000,000 to \$4,000,000 will be available for about 20 awards (single or collaborative) each ranging from \$50,000 to \$175,000/year in Fiscal Year 2009, contingent upon the availability of appropriated funds. In the case of collaborative applications, funding limit applies to each application. 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 applications received. Awards are expected to begin in Fiscal Year 2009. Equal consideration will be given to renewal and new applications. DOE is under no obligation to pay for any costs associated with preparation or submission of applications. DOE reserves the right to fund, in whole or in part, any, all, or none of the applications submitted in response to this Announcement.

### **C. MAXIMUM AND MINIMUM AWARD SIZE.**

See B. Estimated Funding section above.

### **D. EXPECTED NUMBER OF AWARDS.**

See B. Estimated Funding section above.

### **E. ANTICIPATED AWARD SIZE.**

See B. Estimated Funding section above.

### **F. PERIOD OF PERFORMANCE.**

See B. Estimated Funding section above.

### **G. TYPE OF APPLICATION.**

DOE will accept new and renewal applications under the Announcement. The applications must be relevant to the terms of reference for this Announcement and responsive to the particular needs defined.

### **RENEWAL APPLICATION INSTRUCTIONS**

Renewal applications must include the same forms and information as a new application, in addition to the following:

1. Include under the project description/narrative section, information on any research changes (size or scope) that affect the original research endeavor.
2. Include an estimate of anticipated unexpended funds that will remain at the end of the current project period.
3. Include a progress report as an appendix to the narrative section (**this will not count against the page limit**) that describes the results of work accomplished through the date of the renewal application and how such results relate to the activities proposed to be undertaken in the renewal period.

## **PART III - ELIGIBILITY INFORMATION**

### **A. ELIGIBLE APPLICANTS.**

All types of entities are eligible to apply, except ~~other Federal agencies~~, Federally Funded Research and Development Center (FFRDC) Contractors, and nonprofit organizations described in section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995.

Other Federal Agencies are eligible to apply to this Notice. Federal agencies interested in applying should follow instructions at the following website when submitting their proposal. [http://www.sc.doe.gov/grants/fed\\_prop.html](http://www.sc.doe.gov/grants/fed_prop.html)

Preapplications (proposals) are **REQUIRED**; Federal Agencies interested in applying must follow the Preapplication (proposal) instructions on Page 20 of this document and must meet the deadline for submission.

(Change posted 5/7/2008)

### **B. COST SHARING.**

Cost sharing is not required.

### **C. OTHER ELIGIBILITY REQUIREMENTS.**

N/A

## PART IV – APPLICATION AND SUBMISSION INFORMATION

### A. ADDRESS TO REQUEST APPLICATION PACKAGE.

Application forms and instructions are available at Grants.gov. To access these materials, go to <http://www.grants.gov>, select "Apply for Grants", and then select "Download Application Package". Enter the CFDA and/or the funding opportunity number located on the cover of this announcement and then follow the prompts to download the application package.

### B. LETTER OF INTENT AND PREAPPLICATION.

#### 1. Letter of Intent.

A Letter of Intent is not required.

#### 2. Preapplication.

Potential applicants are **required** to submit a preapplication, referencing **Funding Opportunity Number DE-PS02-08ER08-23 for receipt by DOE by 4:30p.m., Eastern Time May 21, 2008**. Preapplications, referencing Funding Opportunity Number DE-PS02-08ER08-23, should be sent to Dr. Kiran Alapaty by e-mail:

kiran.alapaty@science.doe.gov. Please include "Lead PI name -- Preapplication -- DE-PS02-08ER08-23" in the subject line of the e-mail.

All preapplications will be reviewed relative to the scope and research needs of the ARM Program. A response to each preapplication, discussing the potential program relevance of research for a formal application, generally will be communicated within 15 days of receipt. Applicants who have not received a response regarding the status of their preapplication within a reasonable time are responsible for contacting the program to confirm the status.

A preapplication should consist of TWO PAGES of narrative describing the research objectives and methods of accomplishment. Additional required parts of the preapplication are: Principal Investigator's address, telephone and fax number, e-mail address, Funding Opportunity Number, estimate of level of funding requested, and names of all senior personnel.

SC's preapplication policy can be found on SC's Grants and Contracts Web Site at: <http://www.science.doe.gov/grants/preapp.html>. Please contact Dr. Kiran Alapaty for any questions related to this Announcement. Applicants should allow sufficient time so that the formal application deadline is met.

## C. CONTENT AND FORM OF APPLICATION – SF 424 (R&R).

You must complete the mandatory forms and any applicable optional forms (e.g., SF-LLL-Disclosure of Lobbying Activities) in accordance with the instructions on the forms and the additional instructions below. **Files that are attached to the forms must be in Adobe Portable Document Format (PDF) unless otherwise specified in this announcement.**

### 1. SF 424 (R&R).

Complete this form first to populate data in other forms. Complete all the required fields in accordance with the pop-up instructions on the form. To activate the instructions, turn on the “Help Mode” (Icon with the pointer and question mark at the top of the form). The list of certifications and assurances referenced in Field 18 can be found on the DOE Financial Assistance Forms Page at [http://management.energy.gov/business\\_doe/business\\_forms.htm](http://management.energy.gov/business_doe/business_forms.htm), under Certifications and Assurances.

### 2. RESEARCH AND RELATED Other Project Information.

Complete questions 1 through 5 and attach files. The files must comply with the following instructions:

#### **Project Summary/Abstract (Field 6 on the Form).**

The project summary/abstract must contain a summary of the proposed activity suitable for dissemination to the public. It should be a self-contained document that identifies the name of the applicant, the project director/principal investigator(s) (PD/PI), the project title, the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (i.e., benefits, outcomes), and major participants (for collaborative projects). This document must not include any proprietary or sensitive business information as the Department may make it available to the public. The project summary must not exceed 1 page when printed using standard 8.5” by 11” paper with 1” margins (top, bottom, left and right) with font not smaller than 11 point. To attach a Project Summary/Abstract, click “Add Attachment.”

#### **Project Narrative (Field 7 on the Form).**

The project narrative **must not exceed 20 pages** of technical information, including charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard 8.5” by 11” paper with 1 inch margins (top, bottom, left, and right). EVALUATORS WILL ONLY REVIEW THE NUMBER OF PAGES SPECIFIED IN THE PRECEDING SENTENCE. The font must not be smaller than 11 point. Do not include any Internet addresses (URLs) that provide information necessary to review the application, because the information contained in these sites will not be reviewed. See Part VIII.D for instructions on how to mark proprietary application information. To attach a Project Narrative, click “Add Attachment.”

**The first page of your narrative must include the following information (this page will not count in the project narrative page limitation):**

**Applicant/Institution:**

**Street Address/City/State/Zip:**

**Principal Investigator:**

**Address:**

**Telephone Number:**

**Email:**

**DOE/Office of Science Program Office:** Climate Change Research Division

**DOE/Office of Science Program Office Technical Contact:** Dr. Kiran Alapaty

**DOE Grant Number (if Renewal or Supplemental Application):**

Is this a Collaboration? If yes, please list ALL Collaborating Institutions/Pis\* and indicate which ones will also be submitting applications.

*\* Note that collaborating applications must be submitted separately.*

The narrative comprises the research plan for the project. Letters of intent from all non-funded collaborators and short curriculum vitae of all senior personnel must be included in the application. Applications not meeting these requirements will be deemed ineligible during the initial screening process. The major part of the narrative should be devoted to a description and justification of the proposed project, including details of the methods to be used. It should also include a timeline for the major activities of the proposed project, and should indicate which project personnel will be responsible for which activities.

**The project narrative must include:**

**Project Objectives:**

This section should provide a clear, concise statement of the specific objectives/aims of the proposed project.

The Project Narrative comprises the research plan for the project, it should contain enough background material in the Introduction, including review of the relevant literature, to demonstrate sufficient knowledge of the state of the science. The major part of the narrative should be devoted to a description and justification of the proposed project, including details of the method to be used. It should also include a timeline for the major activities of the proposed project, and should indicate which project personnel will be responsible for which activities.

**Project Timetable:**

This section should outline as a function of time, year by year, all the important activities or phases of the project, including any activities planned beyond the project period. Successful applicants must use this project timetable to report progress.

**Project Performance Site:**

Indicate the primary site where the work will be performed. If a portion of the work will be performed at any other sites, identify those sites, also.

**BER Long Term Measure (LTM) Requirement:**

All applications submitted in response to this Announcement must explicitly state how the proposed research will support accomplishment of the BER CCRD's LTM of Scientific Advancement: "**Deliver improved scientific data and models about the potential response of the Earth's climate and terrestrial biosphere to increased greenhouse gas levels for policy makers to determine safe levels of greenhouse gases in the atmosphere.**"

**Appendix 1: Biographical Sketch.**

Provide a biographical sketch for the project director/principal investigator (PD/PI) and each senior/key person listed in Section A on the R&R Budget form. **Provide the biographical sketch information as an appendix to your project narrative. Do not attach a separate file.** The biographical sketch appendix will not count in the project narrative page limitation. The biographical information for each person must not exceed 2 pages when printed on 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right) with font not smaller than 11 point and must include:

*Education and Training.* Undergraduate, graduate and postdoctoral training, provide institution, major/area, degree and year.

*Research and Professional Experience:* Beginning with the current position list, in chronological order, professional/academic positions with a brief description.

*Publications.* Provide a list of up to 10 publications most closely related to the proposed project. For each publication, identify the names of all authors (in the same sequence in which they appear in the publication), the article title, book or journal title, volume number, page numbers, year of publication, and website address if available electronically.

Patents, copyrights and software systems developed may be provided in addition to or substituted for publications.

*Synergistic Activities.* List no more than 5 professional and scholarly activities related to the effort proposed.

*Identification of Potential Conflicts of Interest or Bias in Selection of Reviewers.* Provide the following information in this section.

*Collaborators and Co-editors:* List in alphabetical order all persons, including their current organizational affiliation, who are, or who have been, collaborators or co-authors with you on a research project, book or book article, report, abstract, or paper during the 48 months preceding the submission of this application. Also, list any individuals who are currently, or have been, co-editors with you on a special issue of a journal, compendium, or conference proceedings during the 24 months preceding

the submission of this application. If there are no collaborators or co-editors to report, state “None.”

Graduate and Postdoctoral Advisors and Advisees: List the names and current organizational affiliations of your graduate advisor(s) and principal postdoctoral sponsor(s) during the last five years. Also, list the names and current organizational affiliations of your graduate students and postdoctoral associates during the past five years.

#### **Appendix 2: Current and Pending Support.**

Provide a list of all current and pending support (both Federal and non-Federal) for the Project Director/Principal Investigator(s) (PD/PI) and senior/key persons, including subawardees, for ongoing projects and pending applications. For each organization providing support, show the total award amount for the entire award period (including indirect costs) and the number of person-months per year to be devoted to the project by the senior/key person. **Provide the Current and Pending Support as an appendix to your project narrative. Do not attach a separate file.** The Current and Pending Support Appendix will not count in the project narrative page limitation. Concurrent submission of an application to other organizations for simultaneous consideration will not prejudice its review. Save the information in a separate file and attach to the “Attach Current and Pending Support” field in each profile.

#### **Appendix 3: Bibliography & References Cited.**

Provide a bibliography of any references cited in the Project Narrative. Each reference must include the names of all authors (in the same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers, and year of publication. Include only bibliographic citations. Applicants should be especially careful to follow scholarly practices in providing citations for source materials relied upon when preparing any section of the application. In order to reduce the number of files attached to your application, **please provide the Bibliography and References Cited information as an appendix to your project narrative. This appendix will not count in the project narrative page limitation.**

#### **Appendix 4: Facilities & Other Resources.**

This information is used to assess the capability of the organizational resources, including subawardee resources, available to perform the effort proposed. Identify the facilities to be used (Laboratory, Animal, Computer, Office, Clinical and Other). If appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. Describe only those resources that are directly applicable to the proposed work. Describe other resources available to the project (e.g., machine shop, electronic shop) and the extent to which they would be available to the project. In order to reduce the number of files attached to your application, **please provide the Facility and Other Resource information as an appendix to your project narrative. This appendix will not count in the project narrative page limitation.**

#### **Appendix 5: Equipment.**

List major items of equipment already available for this project and, if appropriate identify location and pertinent capabilities. In order to reduce the number of files

attached to your application, **please provide the Equipment information as an appendix to your project narrative. This appendix will not count in the project narrative page limitation.**

**Appendix 6: Other Attachment.**

If you need to elaborate on your responses to questions 1-5 on the “Other Project Information” document, **please provide this information as an appendix to your project narrative. This appendix will not count in the project narrative page limitation.**

**Do not attach any of the requested appendices described above as files for fields 8, 9, 10, and 11, instead follow the above instructions to include the information as appendices to the project narrative file (these appendices will not count in the project narrative page limitation).**

**3. RESEARCH AND RELATED BUDGET.**

Complete the Research and Related Budget form in accordance with the instructions on the form (Activate Help Mode to see instructions) and the following instructions. You must complete a separate budget for each year of support requested. The form will generate a cumulative budget for the total project period. You must complete all the mandatory information on the form before the NEXT PERIOD button is activated. You may request funds under any of the categories listed as long as the item and amount are necessary to perform the proposed work, meet all the criteria for allowability under the applicable Federal cost principles, and are not prohibited by the funding restrictions in this announcement (See PART IV, G).

**Budget Justification (Field K on the form).**

Provide the required supporting information for the following costs (See R&R Budget instructions): equipment; domestic and foreign travel; participant/trainees; material and supplies; publication; consultant services; ADP/computer services; subaward/consortium/contractual; equipment or facility rental/user fees; alterations and renovations; and indirect cost type. Provide any other information you wish to submit to justify your budget request. **Attach a single budget justification file for the entire project period in Field K.** The file automatically carries over to each budget year.

**4. SF-LLL Disclosure of Lobbying Activities.**

If applicable, complete SF- LLL. Applicability: If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the grant/cooperative agreement, you must complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying."

## Summary of Required Forms/Files

Your application must include the following documents:

Name of Document	Format	Attach to
<b>SF 424 (R&amp;R)</b>	PDF	N/A
<b>RESEARCH AND RELATED Other Project Information</b>	PDF	N/A
Project Summary/Abstract	PDF	Field 6
Project Narrative, including required appendices	PDF	Field 7
<b>RESEARCH &amp; RELATED BUDGET</b>	Form	N/A
Budget Justification	PDF	Field K

### D. SUBMISSIONS FROM SUCCESSFUL APPLICANTS.

If selected for award, DOE reserves the right to request additional or clarifying information for any reason deemed necessary, including, but not limited to:

- Indirect cost information
- Other budget information
- Name and phone number of the Designated Responsible Employee for complying with national policies prohibiting discrimination (See 10 CFR 1040.5)
- Representation of Limited Rights Data and Restricted Software, if applicable
- Commitment Letter from Third Parties Contributing to Cost Sharing, if applicable

### E. SUBMISSION DATES AND TIMES.

#### 1. Letter of Intent Due Date.

A Letter of Intent (LOI) is not required.

#### 2. Preapplication Due Date.

Potential applicants are **required** to submit a preapplication, referencing **Funding Opportunity Number DE-PS02-08ER08-23 for receipt by DOE by 4:30p.m., Eastern Time May 21, 2008**. Preapplications, referencing Funding Opportunity Number DE-PS02-08ER08-23, should be sent to Dr. Kiran Alapaty by e-mail: [kiran.alapaty@science.doe.gov](mailto:kiran.alapaty@science.doe.gov). Please include "Lead PI name -- Preapplication -- DE-PS02-08ER08-23" in the subject line of the e-mail.

All preapplications will be reviewed relative to the scope and research needs of the ARM Program. A response to each preapplication, discussing the potential program relevance of research for a formal application, generally will be communicated within 15 days of receipt. Applicants who have not received a response regarding the status of their preapplication within a reasonable time are responsible for contacting the program to confirm the status.

A preapplication should consist of TWO PAGES of narrative describing the research objectives and methods of accomplishment. Additional required parts of the preapplication are: Principal Investigator's address, telephone and fax number, e-mail address, Funding Opportunity Number, estimate of level of funding requested, and names of all senior personnel.

SC's preapplication policy can be found on SC's Grants and Contracts Web Site at: <http://www.science.doe.gov/grants/preapp.html>. Please contact Dr. Kiran Alapaty for any questions related to this Announcement. Applicants should allow sufficient time so that the formal application deadline is met.

### **3. Formal Applications.**

Formal applications submitted in response to this Announcement must be received by July 21, 2008, 8:00 p.m. Eastern time, to permit timely consideration of awards in Fiscal Year 2008. **You are encouraged to transmit your application well before the deadline. APPLICATIONS RECEIVED AFTER THE DEADLINE WILL NOT BE REVIEWED OR CONSIDERED FOR AWARD.**

### **F. INTERGOVERNMENTAL REVIEW.**

This program is not subject to Executive Order 12372 Intergovernmental Review of Federal Programs.

### **G. FUNDING RESTRICTIONS.**

Cost Principles. Costs must be allowable in accordance with the applicable Federal cost principles referenced in 10 CFR Part 600.

Pre-award Costs. Recipients may charge to an award resulting from this announcement pre-award costs that were incurred within the ninety (90) calendar day period immediately preceding the effective date of the award, if the costs are allowable in accordance with the applicable Federal cost principles referenced in 10 CFR Part 600. Recipients must obtain the prior approval of the contracting officer for any pre-award costs that are for periods greater than this 90 day calendar period.

Pre-award costs are incurred at the applicant's risk. DOE is under no obligation to reimburse such costs if for any reason the applicant does not receive an award or if the award is made for a lesser amount than the applicant expected.

## H. OTHER SUBMISSION AND REGISTRATION REQUIREMENTS.

### 1. Where to Submit.

**APPLICATIONS MUST BE SUBMITTED THROUGH GRANTS.GOV TO BE CONSIDERED FOR AWARD.** Submit electronic applications through the “Apply for Grants” function at [www.Grants.gov](http://www.Grants.gov). If you have problems completing the registration process or submitting your application, call Grants.gov at 1-800-518-4726 or send an email to [support@grants.gov](mailto:support@grants.gov).

### 2. Registration Process.

You must COMPLETE the one-time registration process (all steps) before you can submit your first application through Grants.gov (See [www.grants.gov/GetStarted](http://www.grants.gov/GetStarted)). **We recommend that you start this process at least three weeks before the application due date.** It may take 21 days or more to complete the entire process. Use the Grants.gov Organizational Registration Checklists at <http://www.grants.gov/assets/OrganizationRegCheck.pdf> to guide you through the process. **IMPORTANT:** During the CCR registration process, you will be asked to designate an E-Business Point of Contact (EBIZ POC). The EBIZ POC must obtain a special password called “Marketing Partner identification Number” (MPIN). When you have completed the process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e. Grants.gov registration).

### 3. Application Receipt Notices.

After an application is submitted, the Authorized Organization Representative (AOR) will receive a series of five e-mails. It is extremely important that the AOR watch for and save each of the emails. It may take up to two (2) business days from application submission to receipt of email Number 2. When the AOR receives email Number 5, it is their responsibility to follow the instructions in the email to logon to IIPS and verify that their application was received by DOE. You will need the Submission Receipt Number (email Number 1) to track a submission. The titles of the five e-mails are:

- Number 1 - Grants.gov Submission Receipt Number
- Number 2 - Grants.gov Submission Validation Receipt for Application Number
- Number 3 - Grants.gov Grantor Agency Retrieval Receipt for Application Number
- Number 4 - Grants.gov Agency Tracking Number Assignment for Application Number
- Number 5 – DOE e-Center Grant Application Received

The last email will contain instructions for the AOR to register with the DOE e-Center. If the AOR is already registered with the DOE e-Center, the title of the last email changes to:

Number 5 – DOE e-Center Grant Application Received and Matched

This email will contain the direct link to the application in IIPS. The AOR will need to enter their DOE e-Center user id and password to access the application.

## Part V - APPLICATION REVIEW INFORMATION

### A. CRITERIA.

#### 1. Initial Review Criteria.

Prior to a comprehensive merit evaluation, DOE will perform an initial review in accordance with 10 CFR 605.10(b) to determine that (1) the applicant is eligible for the award; (2) the information required by the announcement has been submitted; (3) all mandatory requirements are satisfied; and (4) the proposed project is responsive to the objectives of the funding opportunity announcement.

#### 2. Merit Review Criteria.

Applications will be subjected to scientific 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; and
4. Reasonableness and Appropriateness of the Proposed Budget.

The evaluation process will include program policy factors such as the relevance of the proposed research to the terms of the announcement and the agencies' programmatic needs. Note that external peer reviewers are selected with regard to both their scientific expertise and the absence of conflict-of-interest issues. Both Federal and non-Federal reviewers may be used, and submission of an application constitutes agreement that this is acceptable to the investigator(s) and the submitting institution.

All applications submitted in response to this Announcement must explicitly state how the proposed research will support accomplishment of the BER CCRD's LTM of Scientific Advancement: **"Deliver improved scientific data and models about the potential response of the Earth's climate and terrestrial biosphere to increased greenhouse gas levels for policy makers to determine safe levels of greenhouse gases in the atmosphere."**

### B. REVIEW AND SELECTION PROCESS.

#### 1. Merit Review.

Applications that pass the initial review will be subjected to a formal merit review and will be evaluated based on the criteria codified at 10 CFR Part 605.10(d) in accordance with the guidance provided in the "Office of Science Merit Review System for Financial Assistance." This Merit Review System is available at: <http://www.science.doe.gov/grants/merit.html>.

## **2. Selection.**

The Selection Official will consider the merit review recommendation, program policy factors, and the amount of funds available.

## **3. Discussions and Award.**

The Government may enter into discussions with a selected applicant for any reason deemed necessary, including but not limited to: (1) the budget is not appropriate or reasonable for the requirement; (2) only a portion of the application is selected for award; (3) the Government needs additional information to determine that the recipient is capable of complying with the requirements in 10 CFR part 600 and 605; and/or (4) special terms and conditions are required. Failure to resolve satisfactorily the issues identified by the Government will preclude award to the applicant.

## **C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES.**

DOE is striving to make awards within 8 months. The time interval begins on the date applications are due or the date the application is received, if there is no specified due date/deadline. Awards will be made in Fiscal Year 2009

## **Part VI - AWARD ADMINISTRATION INFORMATION**

### **A. AWARD NOTICES.**

#### **1. Notice of Selection.**

DOE will notify applicants selected for award. This notice of selection is not an authorization to begin performance. (See Part IV.G with respect to the allowability of pre-award costs.)

Organizations whose applications have not been selected will be advised as promptly as possible. This notice will explain why the application was not selected.

#### **2. Notice of Award.**

A Notice of Financial Assistance Award issued by the contracting officer is the authorizing award document. It normally includes, either as an attachment or by reference: 1. Special Terms and Conditions; 2. Applicable program regulations, if any; 3. Application as approved by DOE/NNSA; 4. DOE assistance regulations at 10 CFR Part 600, or, for Federal Demonstration Partnership (FDP) institutions, the FDP terms and conditions; 5. National Policy Assurances to Be Incorporated As Award Terms; 6. Budget Summary; and 7. Federal Assistance Reporting Checklist, which identifies the reporting requirements.

### **B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS.**

#### **1. Administrative Requirements.**

The administrative requirements for DOE grants and cooperative agreements are contained in 10 CFR Part 600 and 10 CFR Part 605 (See: <http://ecfr.gpoaccess.gov>), except for grants made to Federal Demonstration Partnership (FDP) institutions. The FDP terms and conditions and DOE FDP agency specific terms and conditions are located on the National Science Foundation web site at [http://www.nsf.gov/awards/managing/fed\\_dem\\_part.jsp](http://www.nsf.gov/awards/managing/fed_dem_part.jsp).

#### **2. Special Terms and Conditions and National Policy Requirements.**

##### **Special Terms and Conditions and National Policy Requirements.**

The DOE Special Terms and Conditions for Use in Most Grants and Cooperative Agreements are located at [http://management.energy.gov/business\\_doe/business\\_forms.htm](http://management.energy.gov/business_doe/business_forms.htm). The National Policy Assurances to Be Incorporated As Award Terms are located at [http://management.energy.gov/business\\_doe/business\\_forms.htm](http://management.energy.gov/business_doe/business_forms.htm).

##### **Intellectual Property Provisions.**

The standard DOE financial assistance intellectual property provisions applicable to the various types of recipients are located at [http://www.gc.energy.gov/financial\\_assistance\\_awards.htm](http://www.gc.energy.gov/financial_assistance_awards.htm).

**C. REPORTING.**

Reporting requirements are identified on the Federal Assistance Reporting Checklist, DOE F4600.2, attached to the award agreement.

## **PART VII - QUESTIONS/AGENCY CONTACTS**

### **A. QUESTIONS.**

Questions regarding the content of the announcement must be submitted through the “Submit Question” feature of the DOE Industry Interactive Procurement System (IIPS) at <http://e-center.doe.gov>. Locate the program announcement on IIPS and then click on the “Submit Question” button. Enter required information. You will receive an electronic notification that your question has been answered. DOE will try to respond to a question within 3 business days, unless a similar question and answer have already been posted on the website.

Questions relating to the registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or [support@grants.gov](mailto:support@grants.gov). DOE cannot answer these questions.

### **B. AGENCY CONTACT:**

**GENERAL INQUIRIES ABOUT THIS NOTICE SHOULD BE DIRECTED TO:**

#### **Technical/Scientific Contact:**

Dr. Kiran Alapaty

**Telephone:** (301) 903-3175

**E-mail:** [Kiran.Alapaty@science.doe.gov](mailto:Kiran.Alapaty@science.doe.gov)

## **PART VIII - OTHER INFORMATION**

### **A. MODIFICATIONS.**

Notices of any modifications to this announcement will be posted on Grants.gov and the DOE Industry Interactive Procurement System (IIPS). You can receive an email when a modification or an announcement message is posted by joining the mailing list for this announcement through the link in IIPS. When you download the application at Grants.gov, you can also register to receive notifications of changes through Grants.gov.

### **B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE.**

DOE reserves the right, without qualification, to reject any or all applications received in response to this announcement and to select any application, in whole or in part, as a basis for negotiation and/or award.

### **C. COMMITMENT OF PUBLIC FUNDS.**

The Contracting Officer is the only individual who can make awards or commit the Government to the expenditure of public funds. A commitment by other than the Contracting Officer, either explicit or implied, is invalid.

### **D. PROPRIETARY APPLICATION INFORMATION.**

Patentable ideas, trade secrets, proprietary or confidential commercial or financial information, disclosure of which may harm the applicant, should be included in an application only when such information is necessary to convey an understanding of the proposed project. The use and disclosure of such data may be restricted, provided the applicant includes the following legend on the first page of the project narrative and specifies the pages of the application which are to be restricted:

“The data contained in pages \_\_\_\_\_ of this application have been submitted in confidence and contain trade secrets or proprietary information, and such data shall be used or disclosed only for evaluation purposes, provided that if this applicant receives an award as a result of or in connection with the submission of this application, DOE shall have the right to use or disclose the data herein to the extent provided in the award. This restriction does not limit the government’s right to use or disclose data obtained without restriction from any source, including the applicant.”

To protect such data, each line or paragraph on the pages containing such data must be specifically identified and marked with a legend similar to the following:

“The following contains proprietary information that (name of applicant) requests not be released to persons outside the Government, except for purposes of review and evaluation.”

### **E. EVALUATION AND ADMINISTRATION BY NON-FEDERAL PERSONNEL.**

In conducting the merit review evaluation, the Government may seek the advice of qualified non-Federal personnel as reviewers. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The applicant, by submitting its application, consents to the use of non-Federal reviewers/administrators. Non-Federal reviewers must sign conflict of interest and non-disclosure agreements prior to reviewing an application.

Non-Federal personnel conducting administrative activities must sign a non-disclosure agreement.

#### **F. INTELLECTUAL PROPERTY DEVELOPED UNDER THIS PROGRAM.**

Patent Rights. The government will have certain statutory rights in an invention that is conceived or first actually reduced to practice under a DOE award. 42 U.S.C. 5908 provides that title to such inventions vests in the United States, except where 35 U.S.C. 202 provides otherwise for nonprofit organizations or small business firms. However, the Secretary of Energy may waive all or any part of the rights of the United States subject to certain conditions. (See “Notice of Right to Request Patent Waiver” in paragraph G below.)

Rights in Technical Data. Normally, the government has unlimited rights in technical data created under a DOE agreement. Delivery or third party licensing of proprietary software or data developed solely at private expense will not normally be required except as specifically negotiated in a particular agreement to satisfy DOE’s own needs or to insure the commercialization of technology developed under a DOE agreement.

#### **G. NOTICE OF RIGHT TO REQUEST PATENT WAIVER.**

Applicants may request a waiver of all or any part of the rights of the United States in inventions conceived or first actually reduced to practice in performance of an agreement as a result of this announcement, in advance of or within 30 days after the effective date of the award. Even if such advance waiver is not requested or the request is denied, the recipient will have a continuing right under the award to request a waiver of the rights of the United States in identified inventions, i.e., individual inventions conceived or first actually reduced to practice in performance of the award. Any patent waiver that may be granted is subject to certain terms and conditions in 10 CFR 784.

Domestic small businesses and domestic nonprofit organizations will receive the patent rights clause at 37 CFR 401.14, i.e., the implementation of the Bayh-Dole Act. This clause permits domestic small business and domestic nonprofit organizations to retain title to subject inventions. Therefore, small businesses and nonprofit organizations do not need to request a waiver.

#### **H. NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES.**

Eligible activities under this program include those which describe and promote the understanding of scientific and technical aspects of specific energy technologies, but not those which encourage or support political activities such as the collection and dissemination of information related to potential, planned or pending legislation.

#### **I. AVAILABILITY OF FUNDS**

Funds are not presently available for this award. The Government’s obligation under this award is contingent upon the availability of appropriated funds from which payment for award purposes can be made. No legal liability on the part of the Government for any payment may arise until funds are made available to the Contracting Officer for this award and until the awardee receives notice of such availability, to be confirmed in writing by the Contracting Officer