

**Office of Science  
Financial Assistance  
Summary of  
Funding Opportunity Announcement**

**DE-FOA-0000556  
Atmospheric System Research**

**Office of Biological and Environmental Research (BER)**

**SUMMARY:** The Atmospheric System Research Program (ASR) in the Climate and Environmental Sciences Division (CESD), Office of Biological and Environmental Research (BER) of the Office of Science (SC), U.S. Department of Energy (DOE), supports clouds, aerosol, and radiative transfer research that has the potential to improve the accuracy of regional and global climate models. ASR hereby announces its interest in receiving applications for grants that address an under-represented portfolio and opportunity within the program. For this Funding Opportunity Announcement (FOA), priority will be given to applications that use or extend the new Atmospheric Radiation Measurement (ARM) instrumentation capabilities, address topics within the Aerosol-Cloud-Precipitation Interactions area, and propose program relevant studies involving the recent/ongoing campaigns listed in the **Supplementary Information** section of this FOA. Renewal applications for projects funded under the former ARM Science Program that are due to expire in FY2012 will also be considered under this FOA.

**PREAPPLICATIONS:**

**Preapplications are required.**

Potential applicants are **required** to submit a brief preapplication, referencing FOA **DE-FOA-0000556** for receipt by DOE by **4:30p.m., Eastern Time July 15, 2011.**

Preapplications will be reviewed for conformance with the guidelines presented in this FOA and suitability to the research needs of the ASR Program. A response to the preapplications encouraging or discouraging formal applications will be communicated to the applicants by August 5, 2011. Applicants who have not received a response regarding the status of their preapplication by this date are responsible for contacting the program to confirm this status. Only those preapplicants that receive notification from DOE encouraging a formal application may submit full applications. **No other formal applications will be considered.**

Preapplications referencing FOA **DE-FOA-0000556** should be sent as PDF file attachments via e-mail to the program manager, Dr. Ashley Williamson:

[Ashley.Williamson@science.doe.gov](mailto:Ashley.Williamson@science.doe.gov). Please include "[*Lead PI name*]" -- Preapplication –

FOA DE-FOA-0000556" in the subject line of the e-mail. **No FAX or mail submission of preapplications will be accepted.**

Potential applicants must submit a brief preapplication that consists of a **maximum of two pages** of narrative describing the research objectives, the technical approach(s), and the proposed team members and their expertise. The intent in requesting a preapplication is to save the time and effort of applicants in preparing and submitting a formal project application that may be inappropriate for the program. Preapplications will be reviewed relative to the scope and research needs as outlined in the summary paragraph and in the SUPPLEMENTARY INFORMATION. The preapplication should identify, on the cover sheet, the title of the project, the institution or organization, principal investigator name, telephone number, fax number, and e-mail address, estimated funding levels, and the names and affiliations of the proposed team members. No biographical data need be included, nor is an institutional endorsement necessary. Applicants for collaborative projects should submit a single preapplication identifying all project participants. Renewal applicants are also required to submit a preapplication, which should clearly identify the proposed application as "Renewal".

**APPLICATION DUE DATE: September 6, 2011, 11:59 PM Eastern Time**

Formal applications submitted in response to this FOA must be received by September 6, 2011, 11:59 PM Eastern Time, to permit timely consideration of awards in Fiscal Year 2012. **You are encouraged to transmit your application well before the deadline. APPLICATIONS RECEIVED AFTER THE DEADLINE WILL NOT BE REVIEWED OR CONSIDERED FOR AWARD.**

**IMPORTANT SUBMISSION INFORMATION:**

The full text of the Funding Opportunity Announcement (FOA) is located on FedConnect. Instructions for completing the Grant Application Package are contained in the full text of the FOA which can be obtained at: <https://www.fedconnect.net/FedConnect/?doc=DE-FOA-0000556&agency=DOE>. To search for the FOA in FedConnect click on "Search Public Opportunities". Under "Search Criteria", select "Advanced Options", enter a portion of the title "Atmospheric System Research", then click on "Search". Once the screen comes up, locate the appropriate Announcement.

In order to be considered for award, Applicants must follow the instructions contained in the Funding Opportunity Announcement.

**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). 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).**

**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).

### **Application Receipt Notices**

After an application is submitted, the Authorized Organization Representative (AOR) will receive a series of four 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. The titles of the four 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

Questions regarding the content of the Funding Opportunity Announcement (FOA) must be submitted through the FedConnect portal. You must register with FedConnect to respond as an interested party to submit questions, and to view responses to questions. It is recommended that you register as soon after release of the FOA as possible to have the benefit of all responses. More information is available at

[https://www.fedconnect.net/FedConnect/PublicPages/FedConnect\\_Ready\\_Set\\_Go.pdf](https://www.fedconnect.net/FedConnect/PublicPages/FedConnect_Ready_Set_Go.pdf). 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.

**Modifications:** Notices of any modifications to this Funding Opportunity Announcement will be posted on Grants.gov and the FedConnect portal. You can receive an email when a modification or an announcement message is posted by registering with FedConnect as an interested party for this FOA. It is recommended that you register as soon after release of the FOA as possible to ensure you receive timely notice of any modifications or other announcements. More information is available at <http://www.fedconnect.net>.

**All applications should be in a single PDF file.**

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

**Technical/Scientific Program Contacts:**

**Program Manager:** Dr. Ashley Williamson  
**Phone:** (301) 903-3120  
**E-mail:** [Ashley.Williamson@science.doe.gov](mailto:Ashley.Williamson@science.doe.gov)

### **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 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 FOA 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.

In addition applicants will be evaluated on past performance on related research i.e., funded by ASR or its predecessor programs (ARM Science or Atmospheric Science Programs) as documented in the Progress from DOE-funded research section.

### **Funding**

It is anticipated that approximately \$3,000,000 will be available for about 20 to 25 awards (single or collaborative), each ranging from \$50,000-\$200,000/year in Fiscal Year 2012, contingent upon the availability of appropriated funds. In the case of collaborative applications, the funding limit will apply 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 2012. DOE is under no obligation to pay for any costs associated with preparation or submission of applications.

## SUPPLEMENTARY INFORMATION:

### Background:

The goal of ASR is to improve the treatment of clouds, aerosols, and radiative transfer processes in atmospheric models, that in turn are combined with ocean, terrestrial, and ice sheet models to make projections of climate change. ASR program information is available on <http://science.energy.gov/ber/research/cesd/atmospheric-system-research-program/> and background material on ASR science is available through the ASR Science Plan at: [http://science.energy.gov/~media/ber/pdf/Atmospheric\\_system\\_research\\_science\\_plan.pdf](http://science.energy.gov/~media/ber/pdf/Atmospheric_system_research_science_plan.pdf). The ASR program utilizes the long-term cloud, aerosol, precipitation, and background meteorological data sets from the ARM Climate Research Facility, a unique climatic observational database that is in turn used to advance the predictability of regional and global climate models. ARM has established and operates three fixed site facilities, each representing uniquely different climate regimes (<http://www.arm.gov/sites>) -- the Southern Great Plains (SGP), the Tropical Western Pacific (TWP), and the North Slope of Alaska (NSA). In addition, ARM has also developed two ARM Mobile Facility (AMF) units able to operate in a variety of climatic regimes, on shorter durations up to one year. To provide spatial coverage, the ARM climate research facility includes aerial measurement platforms that can be used to support experiments at the fixed sites and/or in conjunction with the mobile facility. During the past two years, measurement capabilities at all ARM sites have been expanded by acquisition of an extensive suite of new instruments under the American Recovery and Reinvestment Act of 2009 (<http://www.arm.gov/about/recovery-act>).

In addition to novel techniques to advance retrievals and analysis techniques, ASR research emphasizes three overlapping subjects of scientific inquiry: cloud life cycle; aerosol life cycle; and cloud-aerosol-precipitation interactions. For **cloud life cycle** research, themes of research interest include retrieval of cloud micro and macrophysical properties in the context of long term climate records, and analysis of cloud properties and their interactions with atmospheric radiation from a climate perspective. For **aerosols**, ASR focuses on extending the science so that physical, chemical, and biogenic aerosol processes become sufficiently advanced so that they are adequately represented in climate models. The third subject is **cloud-aerosol-precipitation-interactions**, including the quantification of indirect effects of aerosols on clouds and associated processes such as precipitation. ASR strives to extend process level research towards improvement or development of formulations suitable for regional and global climate models. Of relevance to this FOA, the ASR program has particular interest in advancing the following topics within each of the four aforementioned subject areas:

- **Retrievals and Analysis:** Development of new retrieval algorithms and simulators suitable for the new ARM instruments (<http://www.arm.gov/about/recovery-act/instruments>) including the 3-D, multifrequency and precipitation suite; Characterization of microphysical and macrophysical cloud properties obtained from using these observations; Development of algorithms or combined data sets using new ARM aerosol instrument suite for fixed and mobile sites, including Mobile Aerosol Observing System instruments.

- **Cloud Life Cycle:** Observational and/or modeling studies relating cloud dynamics and microphysical processes to updraft speeds associated with different cloud regimes; Intercomparison studies of various convection triggering mechanisms in a single column modeling framework; Methods to reduce documented hyper-activity of convection in climate models; Testing of computationally efficient cloud microphysical schemes in convective cloud schemes; Characterization and quantification of radiative impacts of shallow marine boundary layer clouds and small ice particles in ice clouds using ARM measurements and climate models; Evaluation of entrainment and detrainment processes and rates in convective clouds using atmospheric models and ARM measurements.
- **Aerosol Life Cycle:** Laboratory, data analysis, and/or process modeling studies to quantify or develop predictive relationships of important processes in the aerosol life cycle, including new particle formation and growth, aging, loss processes, optical and droplet/crystal nucleating properties, and direct radiative forcing; Tests of process modeling schemes for aerosol concentrations, mixing state, and properties using observational or laboratory data.
- **Aerosol-Cloud-Precipitation Interactions:** Quantification of radiative forcing by aerosol indirect effects for different cloud regimes using atmospheric models and ARM measurements; Development of improved or new methods to characterize particle size distribution for clouds and aerosols to facilitate unified methods for both clouds and aerosols; Development of improved measurement methods for aerosol or hydrometeor concentration or properties to fill critical gaps in understanding; Methods to develop or validate classification schemes of aerosol effects on precipitation using ARM measurements and process modeling studies.

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

This FOA invites applications for grant research support that address the ASR goal of advancing the science of clouds, aerosols, and their interactions, with the potential to improve confidence in regional and global climate model projection. **Priority consideration under this FOA will be given to research that: (a) uses or extends the new ARM instrumentation capabilities (<http://www.arm.gov/about/recovery-act/instruments>; (b) advances the science of Aerosol-Cloud-Precipitation Interactions; and/or (c) is based on data obtained from recently completed and/or ongoing ARM field campaigns. These campaigns include: the Carbonaceous Aerosols and Radiative Effects Study (CARES); the Storm Peak Laboratory Cloud Property Validation Experiment (STORMVEX); the Midlatitude Continental Convective Clouds Experiment (MC3E); the ARM MJO Investigation Experiment (AMIE), and the Ganges Valley Aerosol Experiment (GVAX). Applications will also be considered for research studies from other campaigns listed on <http://www.arm.gov/campaigns/table>. Applicants should note that while preapplications will be considered for other ASR subject areas described in this FOA, the programmatic review of preapplications will give primary consideration to the priority topical areas described above.**

**Renewal applications for research projects funded under the former ARM Science Program that are due to expire in FY2012 will also be considered under this FOA. Both**

New and Renewal applications will be evaluated competitively by the same merit review panel, and will be subject to the same programmatic review process.

Proposed research is intended to fill critical knowledge gaps, including the exploration of some high-risk approaches. BER also encourages the submission of innovative “high-risk” applications with potential for future high impact on cloud and aerosol research. The probability of success and the risk-reward balance will be considered when making funding decisions.

**ASR funded research must use DOE data (i.e., ARM and/or ASR measurements) as the primary observational data sources; use of additional observational data from other sources (e.g. satellite observations) is encouraged to the extent that these complement ARM data. Applications that require a special field campaign, which has not already been planned and approved by the ARM Program Managers, will not be accepted for consideration. Applications for new instrument development will not be considered.**

#### **Progress from DOE-funded research:**

As described under **Merit Review**, applicants will also be evaluated on past performance on previously funded related research, i.e., funded by ASR or its predecessor programs (ARM Science or Atmospheric Science Programs). Renewal or previously funded applicants will therefore be required to submit as an Appendix to the Project Narrative section a description of past research funded by ASR and/or its predecessor programs, results obtained, and notable accomplishments of the research. Also relevant to this section are collaborative or programmatic contributions of benefit to these programs. The Appendix should be titled “Progress from DOE-funded research”. It will not count towards the 20 page limit of the Project Narrative, but should itself be no longer than 4 pages.

#### **Data Sharing Policy**

**BER has an established data sharing policy, and all ASR applicants are required to demonstrate that their research plans adopt and/or conform to this policy. The BER data sharing policy is:**

“Research data obtained through public funding is a public trust. As such, these data must be publicly accessible. To be in compliance with the data policy of the U.S. Global Change Research Program of full and open access to global change research data, applications submitted in response to this FOA 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 will be preserved, documented, and quality assured, and where it will be archived for access by others. Data of potentially broad use in climate change research and assessments should be archived, when possible, in data repositories for subsequent dissemination. For projects funded under this FOA the relevant DOE-funded data repository is the ARM data archive; details may

be found at <http://www.archive.arm.gov/armlogin/login.jsp>. The repository where the applicant intends to archive the data should be notified in advance of the intention, contingent on a successful outcome of the proposal review. If data are to be archived at the applicant's home institution or in some other location, 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. DOE's Office of Biological and Environmental Research defines the exclusive use period to be one year after the end of the data acquisition period for the proposed performance period of the award but exceptions to extend this period may be justified for unique or extenuating circumstances."

### **Participation in ASR Meetings:**

To ensure that the program meets the broadest needs of the research community and the specific needs of the DOE CESD, successful applicants are expected to attend the annual science team meeting and to participate as ASR program members in the appropriate working group(s) relevant to their efforts.

Costs for participation in ASR annual and working group meetings should be included in the budget. Costs for ASR meeting travel need **not exceed \$5,000 per project year or should be based on TWO trips of ONE week each to Washington, DC.**

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

Posted on the Office of Science Grants and Contracts Web Site  
June 10, 2011.