

**FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT**



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

Atmospheric System Research

Funding Opportunity Number: DE-FOA-0000556

Announcement Type: Amendment

CANCELED

CFDA Number: 81.049

ISSUE DATE: June 10, 2011

**Preapplication Due Date: July 15, 2011, 4:30 p.m. Eastern Time
(Preapplications are Required)**

**Application Due Date: ~~September 6, 2011, 11:49 p.m. Eastern Time~~
Due to FY2012 budget constraints, this FOA is
being canceled.**

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). 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. Part VII of this Funding Opportunity Announcement (FOA) 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 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 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. 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 FOA will be posted on Grants.gov and the FedConnect portal. You can receive an email when a modification or an FOA 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.

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PART I – FUNDING OPPORTUNITY DESCRIPTION

GENERAL INQUIRIES ABOUT THIS FOA SHOULD BE DIRECTED TO:

Technical/Scientific Program Contact:

Program Manager: Dr. Ashley Williamson

Phone: (301) 903-3120

E-mail: Ashley.Williamson@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 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.

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.

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.**

PART II – AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT.

DOE will accept New Applications and Renewal Applications under this FOA.

B. ESTIMATED 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.

C. MAXIMUM AND MINIMUM AWARD SIZE.

The award size will depend on the number of meritorious applications and the availability of appropriated funds.

D. EXPECTED NUMBER OF AWARDS.

The expected number of awards will depend on the number of meritorious applications and the availability of appropriated funds.

E. ANTICIPATED AWARD SIZE.

The award size will depend on the number of meritorious applications and the availability of appropriated funds.

F. PERIOD OF PERFORMANCE.

A maximum of three years will be considered. Out-year funding will depend upon suitable progress and the availability of funds.

G. TYPE OF APPLICATION.

DOE will accept new and renewal applications under this FOA.

Renewal applications compete with all other applications. In preparing a renewal application, applicants should assume that reviewers will not have access to previous applications. The application should be developed as fully as though the applicant were applying for the first time.

The application must include all the information required for a new project, plus the project narrative section should discuss the results from prior work.

Renewal applications must include the same forms and information categories as a new application, except for the following changes:

1. Include under the project description section information on any changes that affect the overall direction of the research being pursued.
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 a separate section 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 DOE National Laboratories 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.

Researchers from other Federal Agencies interested in submitting a proposal are **required** to submit a preproposal referencing this Program Solicitation **DE-FOA-0000556** (see the **Preapplication** section in Part IV B.2). If a formal proposal is encouraged, **Federal agencies should follow the instructions at the following website to submit a formal proposal:** http://science.doe.gov/grants/fed_prop.asp.

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 a Grant Application Package**". Enter the CFDA and/or the funding opportunity number located on the cover of this Funding Opportunity Announcement and then follow the prompts to download the application package.

B. LETTER OF INTENT AND PREAPPLICATION

1. Letter of Intent.

Letters of Intent are not required.

2. Preapplication.

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. 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”.

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 funding opportunity 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. The list of certifications and assurances referenced in Field 17 can be found on the DOE Financial Assistance Forms Page at http://management.energy.gov/business_doe/business_forms.htm, under Certifications and Assurances.

2. RESEARCH AND RELATED Other Project Information.

Complete questions 1 through 6 and attach files. The files must comply with the following instructions:

Project Summary/Abstract (Field 7 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 1-2 pages 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 8 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). Narrative page limits do not include executive summary, abstract or bibliography pages. The Appendix titled “Progress from DOE-funded research”, if present, will not count against this limit.

Applications that are not compliant with either the page or budget limitations described above may be declined administratively without review. 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.”

Letters of endorsement from unfunded collaborators should also be included, if applicable. Please do not submit general letters of support as these are not used in making funding decisions.

The application narrative should begin with a cover page that includes: the project title, the Lead PI’s name and complete contact information.

The cover page must also include the following information (this page will not count in the project narrative page limitation):

Applicant/Institution:

Street Address/City/State/Zip:

Principal Investigator:

Postal Address:

Telephone Number:

Email:

Funding Opportunity Announcement Number: DE-FOA-0000556

DOE/Office of Science Program Office: Office of Biological & Environmental Research

DOE/Office of Science Program Office Technical Contact: Dr. Ashley Williamson

DOE Grant Number (if Renewal or Supplemental Application):

Is this a Collaboration? If yes, please list ALL Collaborating Institutions/Pis.

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.

Appendix 1: Biographical Sketch Appendix.

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 two pages when printed on 8.5” by 11” paper with one-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 five 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.

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. **Provide the Bibliography and References Cited information as an appendix to your project narrative. Do not attach a separate file. The Bibliography & References Cited 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. **Provide the Facility and Other Resource information as an appendix to your project narrative. Do not attach a separate file. The Facilities & Other Resources 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. **Provide the Equipment information as an appendix to your project narrative. Do not attach a separate file. The Equipment Appendix will not count in the project narrative page limitation.**

Appendix 6: Other Attachments.

If you need to elaborate on your responses to questions 1-5 on the “Other Project Information” document, **provide the information as an appendix to your project narrative. Do not attach a separate file. The Other Attachments Appendix will not count in the project narrative page limitation..**

Do not attach any of the requested appendices described above as files for fields 9, 10, 11 and 12; 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. 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 FOA (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. R&R SUBAWARD BUDGET ATTACHMENT(S) FORM.

Budgets for Subrecipients, other than DOE FFRDC Contractors.

You must provide a separate cumulative R&R budget for each subrecipient that is expected to perform work estimated to be more than \$100,000 or 50 percent of the total work effort (whichever is less). If you are selected for award, you must submit a multi-year budget for each of these subrecipients (See Section IV.D for submission of Subrecipients’ multi-year budgets). Download the R&R Budget Attachment from the R&R SUBAWARD BUDGET ATTACHMENT(S) FORM and e-mail it to each subrecipient that is required to submit a separate budget. After the subrecipient has emailed its completed budget back to you, attach it to

one of the blocks provided on the form. Use up to ten letters of the subrecipient's name (plus.xfd) as the file name (e.g., ucla.xfd or energyres.xfd).

5. PROJECT/PERFORMANCE SITE LOCATION(S).

Indicate the primary site where the work will be performed. If a portion of the project will be performed at any other site(s), identify the site location(s) in the blocks provided.

Note that the Project/Performance Site Congressional District is entered in the format of the two-digit state code followed by a dash and a three-digit Congressional district code, for example VA-001. Hover over this field for additional instructions.

Use the Next Site button to expand the form to add additional Project/Performance Site Locations.

6. 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
SF 424 (R&R)	Form	N/A
RESEARCH AND RELATED Other Project Information	Form	N/A
Project Summary/Abstract	PDF	Field 7
Project Narrative, including required appendices	PDF	Field 8
RESEARCH & RELATED BUDGET	Form	N/A
Budget Justification	PDF	Field K
PROJECT/PERFORMANCE SITE LOCATION(S)	Form	N/A
SF-LLL Disclosure of Lobbying Activities, if applicable	Form	N/A

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.

Letters of Intent are not required.

2. Preapplication.

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. 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".

3. Formal Applications.

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.**

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 and 2 CFR 215.

Pre-award Costs. Recipients may charge to an award resulting from this FOA 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 and 2 CFR 215. 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. 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.

2. Registration Process.

You must COMPLETE the one-time registration process (all steps) before you can submit your first application through Grants.gov. 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).

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.

3. 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

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).

2. Merit Review Criteria

Applications will be subjected to scientific merit review (peer review) and will be evaluated against the following criteria, listed in descending order of importance as found in 10 CFR Part 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.

B. REVIEW AND SELECTION PROCESS.

1. Merit Review.

Applications that pass the initial review will be subjected to a merit review 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.sc.doe.gov/grants/merit.asp>.

2. Selection.

The Selection Official will consider the merit review evaluation, 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 6 months after the receipt of applications**. The time interval begins on the date applications are due or the date the application is received. It is anticipated that selections will be made in Fiscal Year 2012.

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.

An Assistance Agreement 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; 4. DOE assistance regulations at 10 CFR Part 600; 5. National Policy Assurances to Be Incorporated As Award Terms; 6. Budget Summary; and 7. Federal Assistance Reporting Checklist, which identifies the reporting requirements.

For grants and cooperative agreements made to universities, non-profits and other entities subject to Title 2 CFR the Award also includes the Research Terms and Conditions located at <http://www.nsf.gov/bfa/dias/policy/rtc/index.jsp>

B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS.

1. Administrative Requirements.

The administrative requirements for DOE grants and cooperative agreements are contained in 10 CFR 600 and 10 CFR Part 605 (See: <http://ecfr.gpoaccess.gov>). Grants and cooperative agreements made to universities, non-profits and other entities subject to Title 2 CFR are subject to the Research Terms and Conditions located on the National Science Foundation web site at <http://www.nsf.gov/bfa/dias/policy/rtc/index.jsp>.

DUNS and CCR Requirements

Additional administrative requirements for DOE grants and cooperative agreements are contained in 2 CFR, Part 25 (See: <http://ecfr.gpoaccess.gov>). Prime awardees must keep their data at CCR current. Subawardees at all tiers must obtain DUNS numbers and provide the DUNS to the prime awardee before the subaward can be issued.

Subaward and Executive Reporting

Additional administrative requirements necessary for DOE grants and cooperative agreements to comply with the Federal Funding and Transparency Act of 2006 (FFATA) are contained in 2 CFR, Part 170. (See: <http://ecfr.gpoaccess.gov>). Prime awardees must register with the new FSRS database and report the required data on their first tier subawardees. Prime awardees must report the executive compensation for their own executives as part of their registration profile in the CCR.

2. 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.

The National Policy Assurances to Be Incorporated As Award Terms are located at <http://www.nsf.gov/bfa/dias/policy rtc/appc.pdf>.

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.

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 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.

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.

Applications submitted through FedConnect will not be accepted.

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. DOE cannot answer these questions.

B. AGENCY CONTACTS:

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

PART VIII - OTHER INFORMATION

A. MODIFICATIONS.

Notices of any modifications to this FOA 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>.

B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE.

DOE reserves the right, without qualification, to reject any or all applications received in response to this FOA 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 FOA, 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, <http://www.gc.doe.gov/documents/patwaivclau.pdf>.

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

N/A