Office of Science
Financial Assistance
Funding Opportunity Announcement
DE-PS02-07ER07-06

Scientific Discovery Through Advanced Computing: Climate Change Prediction Program

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 for research grants in the Climate Change Prediction Program (CCPP), which is a component of the U.S. Climate Change Science Program (CCSP). Applications should describe research projects supporting the development and application of climate models for climate change projections on time scales of decades to centuries. Proposals should clearly describe how that research will contribute to a measurably improved ability to use high-end computing for climatic change projections.

PREAPPLICATIONS

Applicants are encouraged (but not required) to submit a 1-2 page preapplication for programmatic review. There is no deadline for the preapplication, but early submission of preapplications is encouraged to allow time for meaningful discussions.

Preapplications referencing Program Notice DE-PS02-07ER07-06 should be sent to Dr.Anjuli S. Bamzai, CCPP Program Manager, via E-mail to: anjuli.bamzai@science.doe.gov. Please include "SciDAC Preapplication Program Notice" in the E-mail subject field.

APPLICATION DUE DATE: January 25, 2007, 8:00 pm, Eastern Time

Applications must be submitted using Grants.gov, the Funding Opportunity Announcement can be found using the CFDA Number, 81.049 or the Funding Opportunity Announcement number, DE-PS02-07ER07-06. Applicants must follow the instructions and use the forms provided on Grants.gov.

FOR FURTHER INFORMATION CONTACT: Dr. Anjuli S. Bamzai, phone: (301) 903-0294; E-mail: anjuli.bamzai@science.doe.gov

SUPPLEMENTARY INFORMATION:

Background: Scientific Discovery Through Advanced Computing Program (SciDAC) and the Climate Change Prediction Program (CCPP)

Extraordinary advances in computing technology in the past decade have set the stage for major advances in scientific computing. Within the next five to ten years, computers 1,000 times faster than today's terascale computers will become available. In FY 2004 DOE's Office of Science launched an aggressive program to develop and deploy leadership-class computing facilities and announced a twenty-year scientific facilities roadmap that will provide a rich scientific infrastructure for the next two decades. A copy of the plan may be found at: http://www.science.doe.gov/about/Strategic_Plan/Feb-2004-Strat-Plan-screen-res.pdf

The above advances herald a new era in scientific discovery for applications such as climate change modeling and simulation. The goal of the SciDAC is to take advantage of this tremendous scientific computing software and hardware infrastructure capability to advance progress in application areas in Basic Energy Sciences, Biological and Environmental Research including climate modeling, Fusion Energy Sciences, and High Energy Physics, and Nuclear Physics. Accurate prediction of future climate on decadal to centennial time scales continues to be a major scientific objective of the BER Climate Change Research Division (CCRD). The CCPP is focused on developing, testing, and applying coupled climate models that stay at the leading edge of scientific knowledge, computational sciences, software technology and computer architectures. Thus CCPP will continue to support climate models based on definitive theoretical foundations and improved computational methods that run efficiently on current and future high-performance supercomputers.

It is anticipated that applications to this Notice that are selected for support will be funded by the SciDAC portion of the CCPP. During the initial phase of the SciDAC program, DOE-sponsored researchers working on problems in climate change science have achieved key scientific insights in a number of areas of National importance through climate modeling and simulation. All applications chosen for funding in response to this Notice will explicitly state how their proposed research will contribute to a measurably improved ability to computing infrastructure to address challenging problems in climatic change science.

Request for Grant Applications

All applications submitted in response to this Notice must explicitly state how the proposed research will support accomplishment of the BER Climate Change Research Division's (CCRD) Long Term Measure which is to deliver improved climate data and models for policy makers to determine safe levels of greenhouse gases for the Earth system. By 2013, substantially reduce differences between observed temperature and model simulations at subcontinental scales using several decades of recent data.

Researchers from Federally Funded Research and Development Centers (FFRDCs) **are not** eligible under this call.

Applicants seeking renewal of present grants should demonstrate, in their application, (a) the continued relevance of their work to the goal of advancing the science of decade-to-multi-century climatic change modeling and simulation and the contribution their work makes to an improved ability to use high-end computing to address climatic change issues; (b) the quality and relevance of work conducted under previous support to these goals, including a listing of

publications and presentations; and (c) relevant contributions to the development of DOE climate modeling programs, including participation in the organization of meetings and workshops and collaborations with other DOE-supported investigators. The technical portion of applications should include a section titled "Accomplishments under Previous Support" that addresses items (b) and (c) above. Applicants should be prepared to provide, on short notice, complete legible copies of all publications, reports, etc., listed in this section, should they be required for the review process.

Applications focused on the following research topics are encouraged:

(1) Development of improved or new mathematical techniques and numerical algorithms targeting application toward methods that can be incorporated into general circulation models (GCM) running on computers capable of performing over currently available computing architectures. Applicants must demonstrate the role of their proposed research in improving the accuracy and/or computational efficiency of GCMs envisioned for use in making forecasts of long-term climatic change. Foci of the applications might include, but need not be limited to, atmospheric and oceanic dynamics and transport, surface energy and mass exchanges, atmospheric radiative transfer, biogeochemistry, and sea-ice dynamics and thermodynamics. Applications for such activities must include a clear plan for the dissemination of any developed model code, and necessary documentation, to the climate modeling community. (2) Experiments using existing state-of-the-art global climate models that specifically address and shed insights on uncertainties in current climate change projections, e.g. improved estimates of climate sensitivity; carbon-climate feedbacks; changes in ocean circulation; aerosol-climate interactions, and cloud forcing. High-risk high pay-off ideas in new emerging areas of climate change science are encouraged.

Projects that integrate across other research programs across CCRD, and build on past/current SciDAC investments as well as current capabilities in the DOE national laboratories, are particularly encouraged.

To ensure that the CCPP meets both the broad needs of the climate modeling research community and the specific needs of the CCRD, successful applicants will participate as members of the CCPP Science Team along with scientists from related CCRD and SC programs. Costs for participation in Science Team meetings and workshops should be included in each application. Yearly estimates for Science Team travel should be based on one trip of five days to Washington, DC, one trip of five days to San Francisco, CA, and one trip of five days to Denver, CO.

Posted on the Office of Science Grants and Contracts Web Site
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