

Department of Energy Office of Science INCITE Program Seeking Proposals for Large-Scale Scientific Computing

July 15 2004

Secretary of Energy Spencer Abraham announced today that proposals are being accepted for a Department of Energy (DOE) Office of Science program to support innovative, large-scale computational science projects which will allow for high-impact scientific advances through the use of a substantial allocation of computer time and data storage at the department's scientific computing center in Berkeley, Calif.

Now in its second year, the Innovative and Novel Computational Impact on Theory and Experiment (INCITE) program will award a total of 5.5 million supercomputer processor hours and 100 trillion bytes of data storage space at the National Energy Research Scientific Computing (NERSC) Center at DOE's Lawrence Berkeley National Laboratory. The NERSC Center is the Office of Science's flagship facility for unclassified supercomputing.

The INCITE program seeks computationally intensive, large-scale research projects. This program specifically encourages proposals from universities, other research institutions and industry. Industry is specifically solicited to propose challenging problems that may be solved using high performance computing research. There is no requirement of current Department of Energy sponsorship.

The NERSC Center's staff is renowned for helping users of the facility – and will be available to assist researchers whose projects are selected for

allocations of supercomputer time under the INCITE program.

A small number of large awards is anticipated; in 2003, three projects were selected from the 52 proposals submitted.

“These projects are clearly advancing scientific discovery in almost every discipline, making computational modeling as common and effective as theory and experiment as a scientific tool,” said Dr. Raymond L. Orbach, Director of DOE’s Office of Science. “Over the past year, the three INCITE projects used NERSC’s computing resources to make significant progress in our understanding of the makeup of the universe, the chemical process by which plants convert sunlight to energy while removing carbon dioxide from the atmosphere, and the turbulent forces that affect everything from weather to industrial processes.”

“INCITE projects bring tremendous computing power to bear on outstanding scientific and industrial problems of major significance,” said Secretary of Energy Spencer Abraham. “We encourage researchers at universities, national laboratories and in private industry to submit their most challenging proposals where high-end computing resources could power breakthrough science and improve our quality of life and environment.”

To meet the challenge, the Office of Science is dedicating 10 percent of NERSC’s IBM supercomputer time – a total of 5.5 million supercomputing hours – to the INCITE program. NERSC’s 6,656-processor IBM SP supercomputer has a theoretical peak speed of 10 Teraflop/s, or 10 trillion operations per second.

“Making this level of computational resource available offers an unparalleled opportunity to many researchers,” Dr. Orbach said. “For example, one project supported by INCITE over the past year increased

available computer time from 500,000 to 2.7 million hours of computing time, allowing the researchers to achieve unprecedented simulations of exploding supernovae.”

Successful INCITE proposals will describe high-impact scientific research and will be peer reviewed both in the area of research and also for general scientific review comparing them with proposals in other disciplines. Applicants must also present evidence that they can effectively use a major fraction of the 6,656 processors of the

IBM SP supercomputer at the NERSC Center, which is one of the most powerful computers for unclassified research in the United States. Applicants must demonstrate that their codes are ready to run in a massively parallel manner on that computer.

Proposals will be accepted only electronically, following instructions found in the Call for Proposals at www.nersc.gov/about/incitecall.php. Proposals will be accepted until midnight (PDT), Wednesday, September 8, 2004. Awards are expected to be announced by November 8. Access to the NERSC facilities for the awardees will be established on December 1, 2004, and remain in effect until November 30, 2005.

The three computational science projects selected to receive a total of 4.9 million hours of supercomputing time at NERSC in the first year of the INCITE program were:

“Thermonuclear Supernovae: Stellar Explosions in Three Dimensions,” led by Tomasz Plewa of the Center for Astrophysical Thermonuclear Flashes at the University of Chicago in collaboration with scientists there and at DOE’s Argonne National Laboratory, which was awarded 2.7 million processor hours and is expected to significantly advance our understanding of the universe;

“Fluid Turbulence and Mixing at High Reynolds Number,” led by

Professor P.K. Yeung of the Georgia Institute of Technology, which was allocated 1.2 million processor hours and promises to offer insights into the turbulent forces that affect everything from weather to industrial processes; and

“Quantum Monte Carlo Study of Photoprotection via Carotenoids in Photosynthetic Centers,” led by William A. Lester, Jr. of DOE’s Lawrence Berkeley National Laboratory and the University of California Berkeley, which was awarded 1 million processor hours to study the chemical process by which plants convert sunlight to energy while removing carbon dioxide from the atmosphere.

DOE’s Office of Science is the single largest supporter of basic research in the physical sciences in the nation and ensures U.S. world leadership across a broad range of scientific disciplines. For more information about the Office of Science, go to www.science.doe.gov.

The NERSC Center currently serves more than 2,000 scientists at national laboratories and universities across the country researching problems in combustion, climate modeling, fusion energy, materials science, physics, chemistry and computational biology. Established in 1974, the NERSC Center has long been a leader in providing systems, services and expertise to advance computational science. For more information about the NERSC Center, go to www.nersc.gov.

The original press release can be found [here](#).

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