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Supercomputing Conference Highlights NASA Earth, Space Missions

WASHINGTON -- NASA will showcase the latest achievements in climate simulation, space exploration, aeronautics engineering, science research and supercomputing technology at the 23rd annual Supercomputing 2010 (SC10) meeting.

The leading international conference on high-performance computing, networking, storage and analysis will be held Nov. 13-19, 2010, at the Ernest N. Morial Convention Center in New Orleans.

NASA's SC10 exhibit will feature nearly 50 demonstrations including high-resolution simulations of Hurricane Katrina that give new insight into tropical storm formation and development. The simulations potentially could save lives and reduce property damage. Scientists also will present modeling and simulation projects to predict and analyze potential and actual sources of debris that pose risk to remaining space shuttle missions during launch and in orbit; design and develop next-generation heavy-lift and multipurpose crew vehicles for future exploration of space; and help reduce aircraft landing-gear noise, a major source of noise pollution near metropolitan airports.

"Our advanced modeling and simulation tools and expertise are integral to scientific and engineering advancements throughout NASA," said Rupak Biswas, chief of the NASA Advanced Supercomputing (NAS) Division at NASA's Ames Research Center in Moffett Field, Calif.

"Combined with the power of supercomputers, massive data storage, high-speed networks, computer science expertise and visualization technologies, these numerical computations are critical to agency work ranging from designing more efficient rotorcraft, to advancing our understanding of global climate change, to designing and analyzing new space crew modules, just to name a few."

The high-end computing operations at both the NAS facility at Ames and the NASA Center for Climate Simulation (NCCS) at the agency's Goddard Space Flight Center in Greenbelt, Md., have undergone significant expansions to handle the ever-increasing need for computational resources, particularly for Earth science research.

This year, the NAS facility completed a series of extensions to NASA's largest supercomputer, Pleiades. The agency increased the system to 84,992 cores, achieving a peak performance of over one petaflop, the ability to do more than one quadrillion floating point operations per second.

Pleiades is one of the most cost-effective supercomputers in the world. The recent expansion, in part, supports the NASA Earth Exchange, a new collaboration platform for the Earth science community that provides a mechanism for scientific collaboration and knowledge sharing.

In October 2010, NCCS doubled the capacity of its Discover supercomputer. The new cluster provides a scalable system with significantly reduced floor space and highly efficient power and cooling. Discover's combined 29,368 cores yield a peak performance of more than 320 teraflops.

"Discover already has begun hosting climate simulation runs for the next Intergovernmental Panel on Climate Change Assessment Report that will go back a full millennium and forward to 2100," said Phil Webster, NCCS project manager and chief of the Computational and Information Sciences and Technology Office at Goddard. "With our newest processors, NASA scientists plan to perform global weather and climate simulations at resolutions approaching one kilometer, which is the fidelity of many satellite observations."

Demonstrations in NASA's exhibit (booth # 3839) represent work by researchers at Ames, Goddard, NASA's Glenn Research Center in Cleveland; NASA's Langley Research Center in Hampton, Va.; and NASA's Jet Propulsion Laboratory in Pasadena, Calif., in addition to

NASA's various university and corporate partners.

For more information about the NASA's exhibit at the SC10 meeting, visit:
http://www.nas.nasa.gov/SC10

For information about NASA's High-End Computing Program, visit:
http://www.hec.nasa.gov

For information about the SC10 meeting, visit:
http://sc10.supercomputing.org

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