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Livermore Lab Awarded "Special" Gordon Bell Prize

PORTLAND, Ore. — The Department of Energy's Lawrence Livermore National Laboratory played a major role in a simulation project that was awarded a 1999 Gordon Bell Award supercomputing's "special" prize by competition judges. The special category recognizes creation of practical simulations that achieve new levels of performance. The software employed can be reused on related applications such as combustion, radiation transport, atmospheric and ocean modeling, petroleum reservoir modeling, or semiconductor device simulation.

A team including a DOE subcontracting organization, Old Dominion University, and NASA earned the special category prize for a simulation that obtained an unprecedented level of performance on an unstructured grid application.

The entry entitled "Achieving High Sustained Performance in an Unstructured Mesh CFD Application," simulated the flow of air over an airplane wing. Their highest performance run was 0.227 Teraflop/s (trillion floating operations per second) on an unclassified partition of 3,072 nodes of DOE's Accelerated Strategic Computing Initiative "Red" computer at Sandia National Laboratory. The group also ran the same simulations on other high-end computers, including LLNL's ASCI Blue Pacific.

David Keyes, acting director of LLNL's Institute for Scientific Computing Research and chairman of Old Dominion University's Mathematics and Statistics Department, represented Livermore on the team. Other members include Dinesh Kaushik of Old Dominion University, Kyle Anderson of NASA, and William Gropp and Barry Smith of Argonne National Laboratory in Illinois.

"Our simulation was not the fastest overall submitted in this year's competition," Keyes said, "but a three-judge panel created a special category of

the award this year to recognize the significance of so scalable an implementation of an implicit unstructured grid solver.” In addition, the researchers demonstrated that such performance could be obtained from a general-purpose library of parallel code modules.

A multi-year investment by the DOE in parallel scientific software enabled the researchers to implement their algorithmic ideas in software that can be reused on related applications.

Founded in 1952, Lawrence Livermore National Laboratory is a national security laboratory, with a mission to ensure national security and apply science and technology to the important issues of our time. Lawrence Livermore National Laboratory is managed by the University of California for the U.S. Department of Energy.

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