

# NASA Supercomputer Ranks Among World's Fastest

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(PhysOrg.com) -- NASA's premiere supercomputer located at Ames Research Center, Moffett Field, Calif., has garnered the sixth spot on the Top500 list of the world's most powerful computers.

After a recent upgrade, NASA's premiere supercomputer located at Ames Research Center, Moffett Field, Calif., has garnered the sixth spot on the Top500 list of the world's most powerful computers. The announcement was made Nov. 17, 2009 at the International Conference for High-Performance Computing, Networking, Storage, and Analysis (SC09) in Portland, Oregon.

The Pleiades supercomputer is an SGI Altix ICE system with 14,080 [Intel Xeon](#) quad-core processors (56,320 cores, 110 racks) running at 544 trillion floating point operations per second (teraflops) on the LINPACK [benchmark](#), the industry standard for measuring a system's floating point [computing power](#). One of the most powerful general-purpose supercomputers ever built, Pleiades also features the world's largest InfiniBand interconnect network.

The LINPACK run also measured electrical power consumption—an increasingly important consideration in high-end computing. Using a total of 2.35 megawatts, or 232 megaflops per watt, Pleiades continues to be an energy efficient platform.

“While the LINPACK number is remarkable, the recent Nehalem-based addition to Pleiades is even more impressive in the actual work it can

accomplish,” said William Thigpen, Pleiades project manager at the NASA Advanced Supercomputing (NAS) Division at Ames. “Pleiades has become the agency workhorse, delivering over 275 million hours in its first year of production. Initial testing indicates that the new addition of 9,216 cores will do the work done by over 20,000 of the previous generation cores,” Thigpen added.

Among the scientific and engineering projects accepted for computer time on Pleiades are:

- Extensive simulations of large computational problems for future space vehicle design;
- Development of increasingly detailed models of large-scale dark matter halos and galaxy evolution;
- Running coupled atmosphere-ocean models to assess decadal climate prediction skill for the Intergovernmental Panel on Climate Change.

The InfiniBand fabric interconnecting Pleiades' 7,040 nodes requires almost 24 miles of cabling, consisting of double data rate, quad data rate, and hybrid cables. InfiniBand is also used as the primary local-area network backbone that interconnects computing, storage, and visualization systems, and to facilitate cross-system data file access. This enables scientific visualization and data analysis to execute concurrently as computer jobs run, producing ultra-high-fidelity results for the enormous datasets used in NASA mission projects.

Originally installed in fall 2008, and landing in third place on the November 2008 TOP500 list, Pleiades was acquired to augment the space agency's high-end computing requirements in supporting four key mission areas: aeronautics research, exploration systems, science, and space operations. The latest addition is focused on Earth science research.

Provided by JPL/NASA ([news](#) : [web](#))

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