National Aeronautics and Space Administration

PLEIADES

NASA's Pleiades supercomputer is currently ranked seventh on the Top500 list of the world's most powerful supercomputers.

- System Architecture:
  - SGI Altix ICE consisting of 11,776 dual-socket nodes
  - Intel quad- and hex-core Xeon processors (Nehalem, Harpertown and Westmere)
  - Total cores: 112,896
  - Total memory: 191 terabytes
- Peak performance of 1.34 petaflops
  - LINPACK rating: 1.09 petaflops (June 2011, using 11,648 nodes)
- 64 nodes enhanced with Nvidia graphics processing units (GPU): 43 teraflops
- Features the world's largest InfiniBand interconnect network, with more than 65 miles of double and quad data rate cabling
- Serves as a major computational resource for all NASA mission directorates: aeronautics research, exploration systems, science, and space operations
- Central component of an integrated environment providing users with mass storage, high-speed networking, modeling and simulation, data analysis and visualization, application performance optimization, and advanced user services

Among the scientific and engineering projects running on Pleiades:

- High-resolution global models that yield more accurate hurricane predictions—tropical cyclones can now be realistically predicted up to 5 days in advance
- High-fidelity analyses of every Space Shuttle launch to assess debris damage, make repair decisions, and clear vehicles for safe landing
- Unprecedented cosmological simulations of galaxy formation that help to better understand how spiral and elliptical galaxies are created
- Computational fluid dynamics simulations of complex aircraft, to improve vehicle performance, diminish noise, and reduce environmental impact
- Extensive simulations of complex aerodynamic properties for design of future space vehicles

Pleiades has been operational since November 2008.





