



For the Week of November 30th, 2009



U.S. DEPARTMENT OF
ENERGY



OAK RIDGE NATIONAL LABORATORY

MANAGED BY UT-BATTELLE FOR THE DEPARTMENT OF ENERGY

Jaguar: The World's Most Powerful Supercomputer. For Science!

Oak Ridge supercomputer takes number 1 on Top500 list

- An ARRA funded upgrade to the OLCF's Cray XT5 has made the "Jaguar" supercomputer the world's fastest.
- To net the number-one spot on the TOP500 list of the world's fastest supercomputers, Jaguar's Cray XT5 component was upgraded from four-core to six-core processors.
- Jaguar ran a benchmark program called High-Performance Linpack (HPL) at a speed of 1.759 petaflops (PF). The rankings were announced in Portland at SC09.
- HPL is one of four applications on the Jaguar that exceed 1 PF of performance. DCA++: 1.9 PF, LSMS-WL 1.8 PF, NWChem 1.4 PF



“Supercomputer modeling and simulation is changing the face of science and sharpening America’s competitive edge. Oak Ridge and other DOE national laboratories are helping address major energy and climate challenges and lead America toward a clean energy future.”

- Secretary of Energy Steven Chu



ORNL-Led Team Takes Prize for World's Fastest Science App

Second ORNL-led team also finalist for Gordon Bell Prize

- A team led by ORNL's Markus Eisenbach was named winner of the 2009 ACM Gordon Bell Prize, which honors the world's highest-performing scientific computing applications.
- Another team led by ORNL's Edo Aprà was also among nine finalists for the prize.
- Eisenbach and colleagues achieved 1.84 petaflops on Jaguar using an application that analyzes magnetic systems and the effect of temperature on these systems.
- By accurately revealing the magnetic properties of specific materials, the project will boost the search for stronger, more stable magnets, affecting everything from magnetic storage to electric vehicles.



“What we can do is calculate the Curie temperature for materials with high accuracy without external parameters. These first-principles calculations are orders of magnitude more computationally demanding than previous models; it's only with a petascale system such as Jaguar that calculations like this become feasible.”

– ORNL's Markus Eisenbach

Tennessee Supercomputing Titans Triumph at HPC Challenge Awards

Jaguar takes three gold medals and a bronze while 'Kraken' scores two silvers

- Two powerful Cray XT5 systems at the ORNL computing complex outmuscled competitors to win three of four of this year's HPC Challenge awards.
- Results of the "Best Performance" awards, which measure excellence in handling computing workloads, were announced Nov. 17 at SC09.
- ORNL's Jaguar supercomputer took home the lion's share of the honors, with three "gold medals" and one "bronze."
- Jaguar also posted the highest performance on the remaining two applications, where prizes are not awarded



OLCF Project Director Buddy Bland accepts one of three first place certificates for the 2009 HPC Challenge awards.

"It is very gratifying that Jaguar has been recognized as a very powerful machine. The HPC Challenge benchmarks are designed to give a better view of the entire system's performance. Jaguar was designed to be the most powerful system for scientific applications, and these results reflect that design and implementation."

OLCF Project Director, Buddy Bland

ORNL Computing Garner Awards from Online Computing Publications

HPCwire and insideHPC recognize Oak Ridge for computing leadership

- ORNL has been hand-picked by insideHPC readers to receive the publication's first-ever HPC Community Leadership Award.
- Jaguar and ORNL also received an HPCwire Editors' Choice Award for "Top Supercomputing Achievement." Jaguar earned the title of the world's fastest computer at SC09.
- ORNL's Suzy Tichenor was named one of "2010's, People to Watch" by HPCwire
- All awards were presented at SC09.

"ORNL has blazed a trail at the very high end of supercomputing in recent years. Bringing together the expertise, funding, and organizational resources to build a record of sustained accomplishment at this level is a truly remarkable achievement."

– insideHPC Editor John West



ORNL's Jeff Nichols, associate laboratory director for computing and computational sciences, accepts awards from insideHPC's John West, and Tom Tabor from HPCwire.

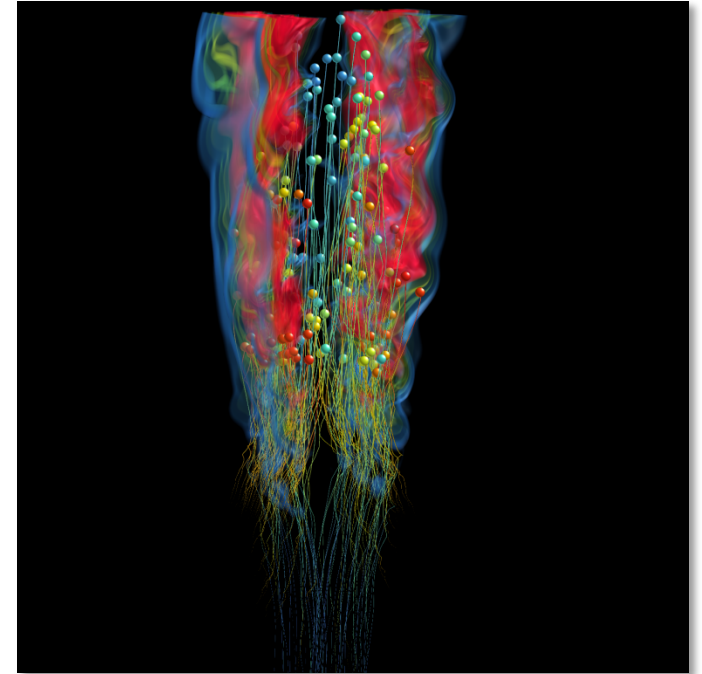
ADIOS Ignites Combustion Simulations

ORNL-led research enhances scaling of codes

- To address the scaling and I/O issues that affect leading software packages, a team of researchers have developed the ADaptable I/O file System (ADIOS).
- ADIOS is an I/O middleware package that has shown great promise in fusion, scaling up to 140,000 cores for XGC-1. It has also enhanced the performance of GTC, GTS, and the CHIMERA astrophysics code.
- ADIOS recently made its mark in the field of combustion, helping to greatly increase the I/O efficiency of the leading combustion code S3D.
- Though the S3D team was able to fully scale the code to ORNL's entire Cray XT5 supercomputer, known as Jaguar, the scaling of the I/O proved to be difficult.
- S3D's newfound scalability and flexible architecture has led ORNL's Ramanan Sankaran to explore creating a custom I/O transport method to perform special manipulations to the I/O and the data.

"I appreciate the clean yet capable interface and that from my perspective, it just works. It would have been fairly difficult for us to get this work finished in time for our targeted paper deadline using our previous I/O solution, but now I'm confident that we'll make it thanks to ADIOS and the help of its team."

– Sandia National Laboratory's Ray Grout,
and S3D team member



ADIOS enabled researchers using S3D to greatly increase the I/O efficiency of their code, used for combustion research.