

NCCS Snapshot

The Week of June 4, 2007

NATIONAL CENTER
FOR COMPUTATIONAL SCIENCES

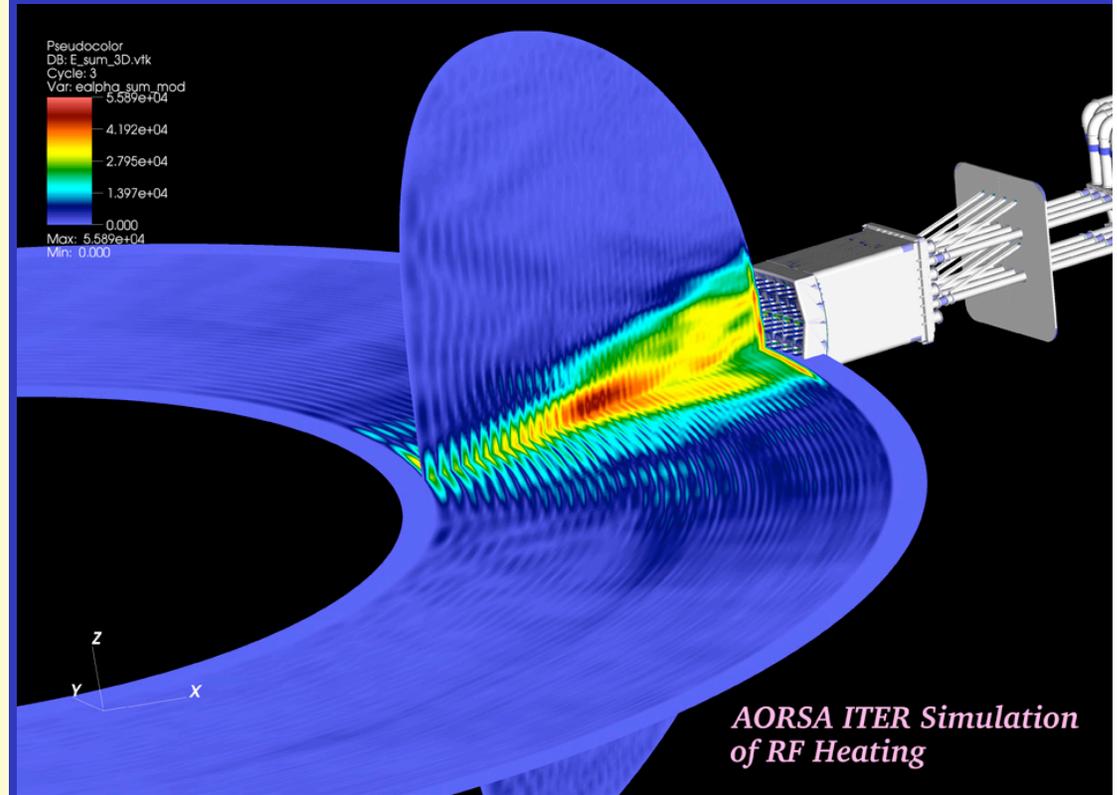


Oak Ridge National Laboratory
U.S. Department of Energy

Radio Waves Will Make Reactor Hotter than the Sun

- Team led by Fred Jaeger and Lee Berry of ORNL simulates the effect of radio waves on a fusion plasma
- Radio waves will help manipulate the plasma, increasing its heat to ten times that of the sun
- Simulation uses 22,500 processor cores on ORNL's Jaguar supercomputer to achieve 73 trillion calculations per second

Fusion code simulates waves to heat and control ITER reactors



Jaguar Calculations Help Turn Vehicle Exhaust into Power

Researchers simulate materials that turn heat into electricity



- Waste heat claims 60% of the energy generated by an automobile engine
- Team led by Jihui Yang of General Motors simulates materials that turn that heat into electricity
- GM team's largest-ever simulation – 1,000-plus atom supercell – made possible by leadership computing resources at NCCS



Staffers Share Expertise with Cray Community

- ▶ NCCS staffers give more than a quarter of the technical presentations at meeting for Cray user community; the meeting theme was “New Frontiers”
- ▶ Mark Fahey is elected Cray User Group treasurer and is named to its board of directors
- ▶ Trey White is named local arrangements chair for the 2009 meeting, to be hosted by ORNL

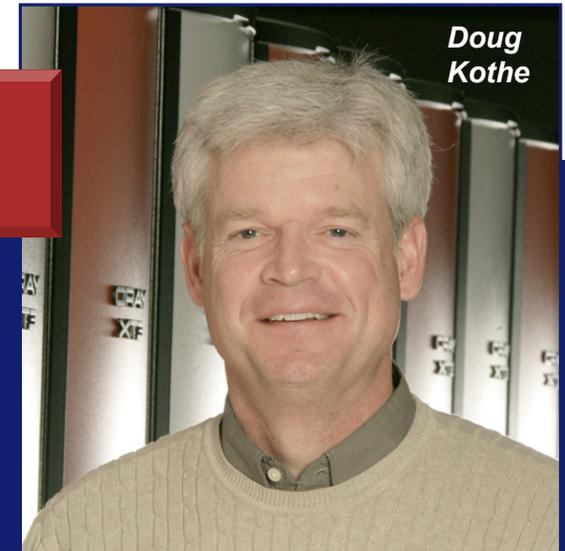


Cray user meeting features presentations from all four NCCS groups

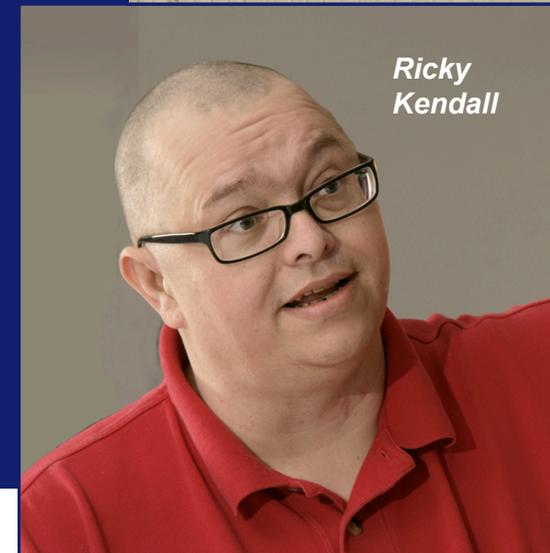
Kothe and Kendall Discuss HPC for Nuclear Science

LCF committed to bringing state-of-the-art computing to field

- Nuclear energy field is poised to make use of high-performance computing
- NCCS Director of Science Doug Kothe chairs the conference session entitled “HPC Systems and Nuclear Energy”
- Scientific Computing Group leader Ricky Kendall presents a talk entitled “How Will I Get My Code to Scale on the Cray XT System (or Any Big Machine)?”



Doug
Kothe



Ricky
Kendall

Workshop Focuses on Tools for Petascale and Beyond

Explosion in number of processors challenges developers



Speaker Greg Watson

- **ORNL workshop focuses on customizing Eclipse integrated development environment for HPC**
- **Developers working to simplify code-writing for massively parallel supercomputers**

Scientists Look to the Horizon for Computing Challenges

- Meeting looks to exascale systems, which will be thousands of times more powerful than today's fastest supercomputers
- New systems will present unprecedented challenges in computer architecture, software algorithms, data management, analysis, and storage
- ORNL hosts more than 270 from around the country at meeting to focus exascale resources on the most urgent national and global challenges



Gathering anticipates systems capable of a million trillion calculations a second