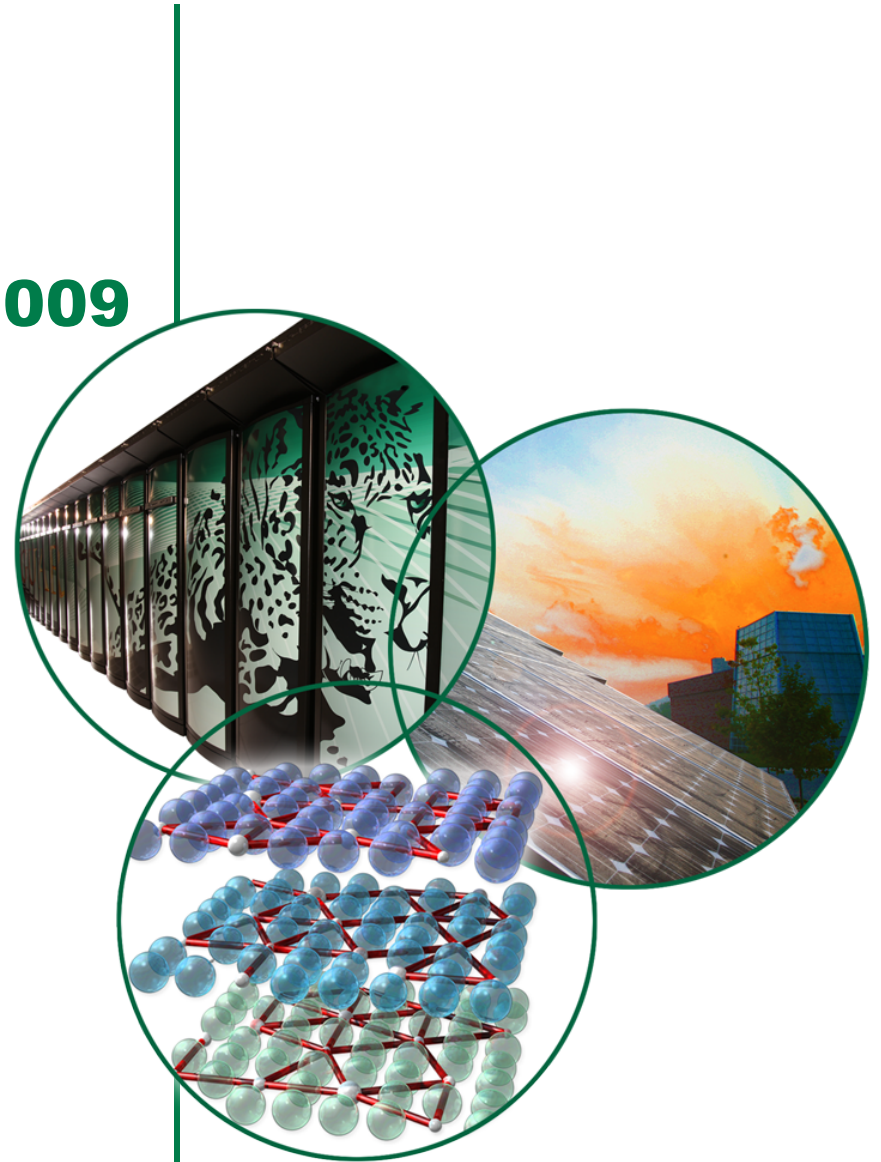


# NCCS Snapshot

## The Week of February 16, 2009

### Oak Ridge Leadership Computing Facility



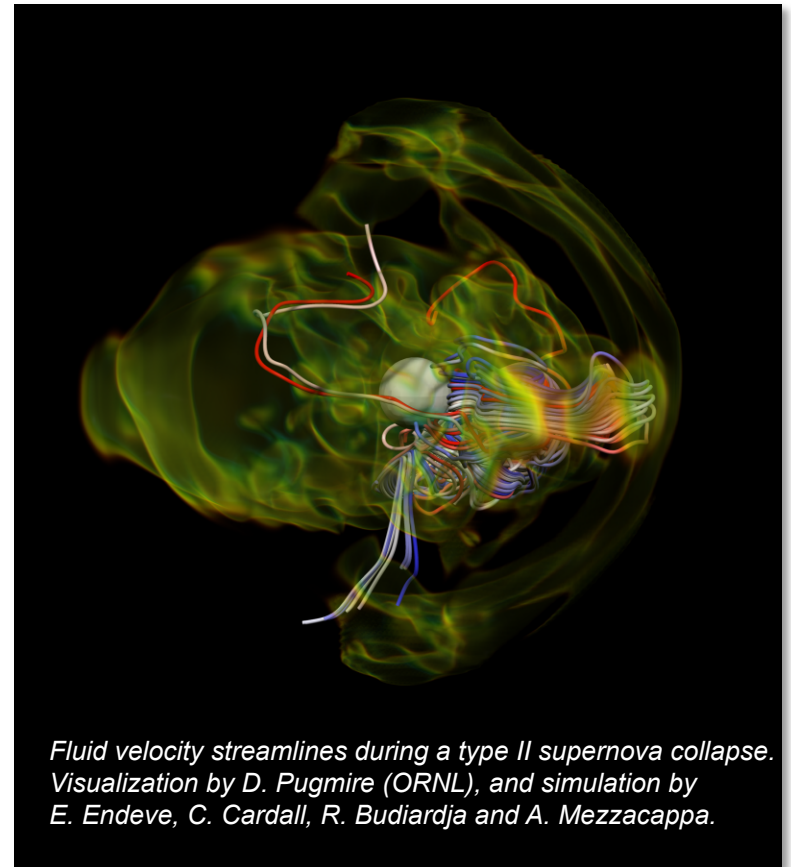
U.S. DEPARTMENT OF  
**ENERGY**

 **OAK RIDGE NATIONAL LABORATORY**  
MANAGED BY UT-BATTELLE FOR THE DEPARTMENT OF ENERGY

# Supercomputer illuminates supernovas in 3D

*Petascale runs go where no supernova simulation has gone before*

- The first realistic, three-dimension simulations of the exploding stars known as core-collapse supernovas are being run on ORNL's supercomputer Cray XT Jaguar system
- The simulations will give new insights to supernovas, such as the creation of new elements from the supernova explosion and the kick with which the explosion sends the remnant neutron star on its way
- The team is able to conduct simulations in three dimensions without oversimplifying the supernova process due to recent upgrades to Jaguar, which operates at a peak speed of 1.64 quadrillion calculations each second



*Fluid velocity streamlines during a type II supernova collapse. Visualization by D. Pugmire (ORNL), and simulation by E. Endeve, C. Cardall, R. Budiardja and A. Mezzacappa.*

*“The ability to go to three dimensions, I cannot overstate the importance of that. This is the first model of its kind. Even as a single model, this will advance supernova theory in a significant way for all involved in supernova theory.”*

**Anthony Mezzacappa, ORNL  
astrophysicist and principal investigator  
on project**

# Supercomputing seeks energy savings

*ORNL facility takes all-angles approach*



- Power and cooling advances in the Cray XT system Jaguar places ORNL among the most energy-efficient locations for high performance computing, enabling groundbreaking research with minimal resource impact
- A newly introduced Cray cooling system for Jaguar, dubbed ECOphlex, complements the chillers and improves efficiency. Without ECOphlex, the number of air-based units would not fit into the computer room, making Jaguar possible
- Instead of using the 208-volt power supply that Jaguar used in the past, the system now runs on 480-volt power, saving the laboratory \$1 million

*“We take energy utilization very seriously. The scale of this machine is just phenomenal. There are very few places in the world where this computer could have been built.”*

Buddy Bland, LCF Project  
Director of ORNL's NCCS

# ORNL Hosts Lustre Workshop

*Community gathers to address issues*



- The NCCS, Sun Microsystems, and Cray, Inc. recently held a two-day workshop on Lustre scalability at ORNL
- Participants from across the country gathered to identify scalability issues and develop a realistic roadmap for Lustre by 2012
- A follow-up meeting, the Lustre Scalability Summit, will be held in April in conjunction with the 2009 Lustre User Group meeting



*Lustre users from across the country recently gathered at ORNL to identify the file system's most pressing issues*

*“We’re gathering the entire Lustre community to agree upon the primary goals and the gaps that we have now in a parallel file system environment and how best to address those gaps.”*

**Galen Shipman, group leader of  
NCCS's Technology Integration Group**

# 2009 HPC Workshops and Training Sessions Announced

*NCCS offers a variety of training opportunities to users*



- The NCCS will conduct several workshops and teaching sessions in 2009 to help current and future users of HPC to become familiar with the new petascale systems
- "Climbing to Petaflop on Cray XT": 2009 Cray XT5 Quad-core Workshop at ORNL: will be jointly sponsored by NCCS and NICS April 13-16, 2009, covering the important issues in obtaining increased performance from the powerful new XT systems
- For additional information regarding the workshops and registration go to

<http://www.nccs.gov/user-support/training-education/workshops/>