

NCCS Snapshot

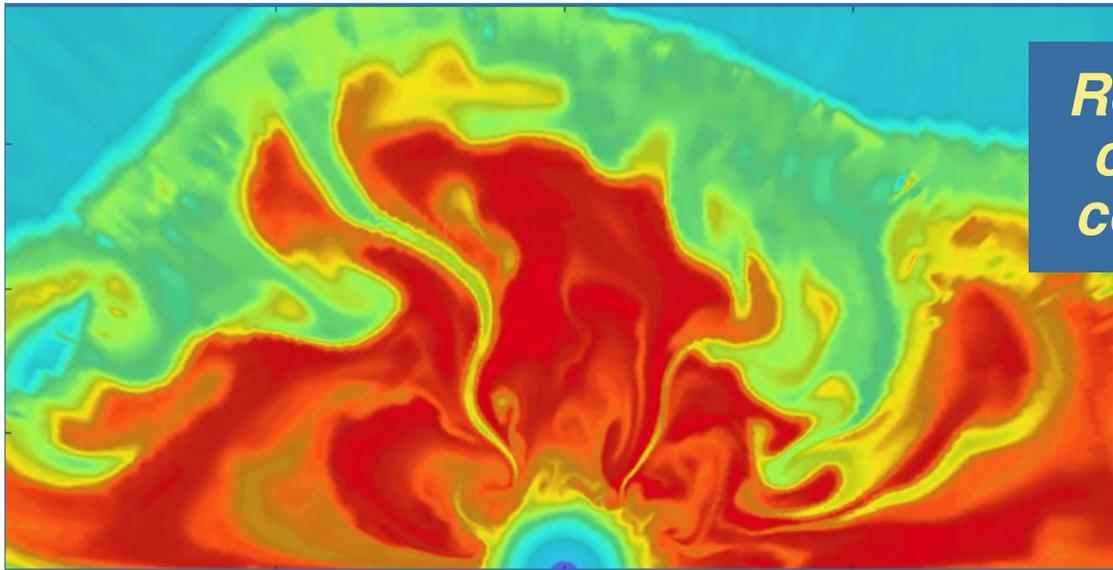
The Week of April 30, 2007

NATIONAL CENTER
FOR COMPUTATIONAL SCIENCES



Oak Ridge National Laboratory
U.S. Department of Energy

Astrophysicists Close In on Exploding Stars



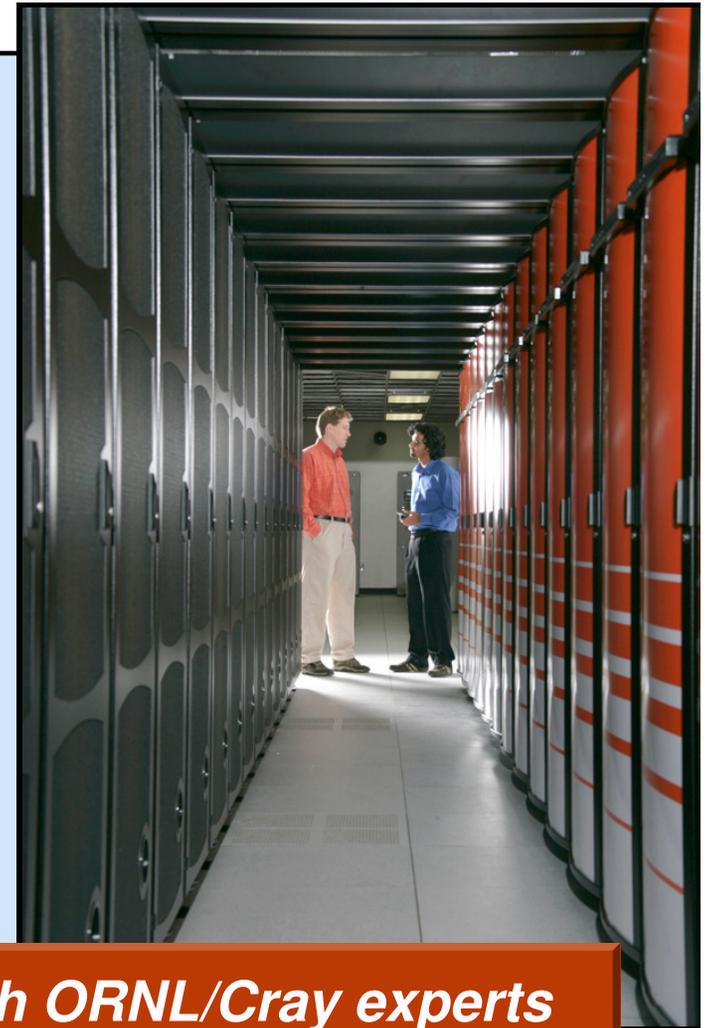
Researchers come a step closer to explaining the core-collapse supernova

This image shows entropy in the late stages of a core-collapse supernova as simulated on the NCCS Jaguar supercomputer. The red, high-entropy plumes push the shock outward. The nascent neutron star, which is all that will be left after the supernova, is shown at bottom center in blue. This simulation was of a star 11 times the mass of the sun.

- A team led by ORNL's Anthony Mezzacappa is using Jaguar to provide new details of the core-collapse supernova
- Mezzacappa's research suggests the stalled shockwave created by the core collapse is revived later than previously believed
- The team has simulated a star 11 times the mass of the sun (11 solar masses) in two dimensions
- It will continue the simulations with 15- and 20-solar-mass stars, then move on to simulations in three dimensions

Workshop to Show Users How to Get the Most Out of Future Supercomputers

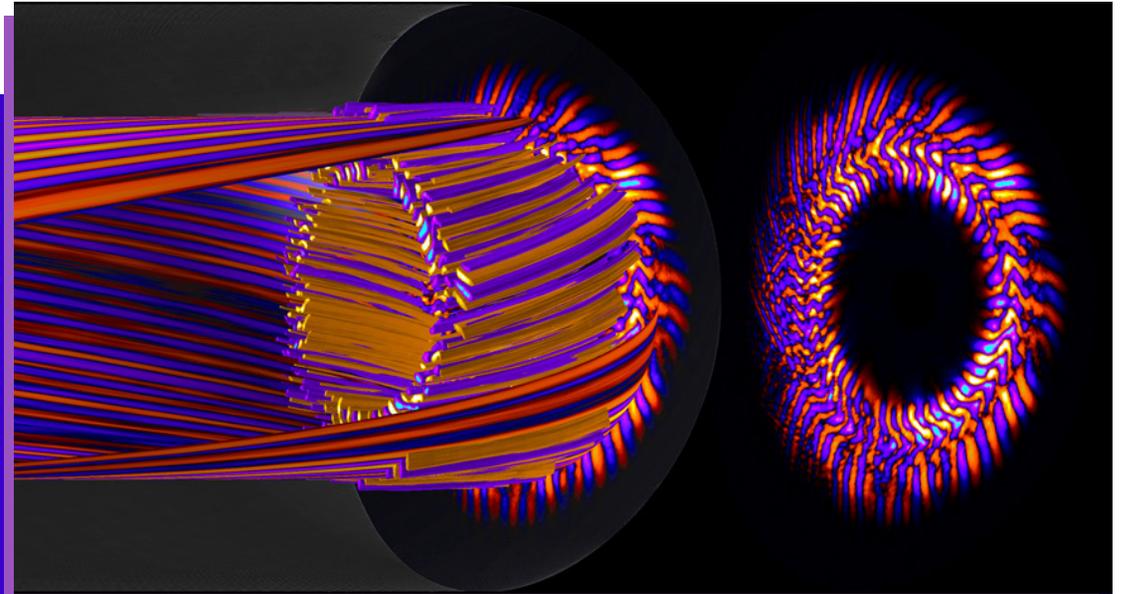
- **NCCS Scaling to Petaflops**
Workshop will focus on upcoming multiple core systems
- **Workshop will be held**
July 30–August 1
- **NCCS and Cray experts will**
explain specialized tools and help researchers adapt codes for next-generation supercomputers
- **New systems will enable simulations**
of unprecedented complexity



Hands-on event will pair researchers with ORNL/Cray experts

Fusion Code Breaks Another Record on Jaguar

- Jaguar breaks the record for Princeton Plasma Physics Lab's premier fusion code
- Gyrokinetic Toroidal Code runs on nearly 23,000 processor cores:
 - Pushes 11.6 billion particles one step per second
 - Moves 74 billion particles total
- High number of particles allows scientists to reduce statistical noise and achieve greater fidelity



Simulation moves 74 billion particles

NCCS Attracts High-Profile Visitors

Prominent guests tour world-class facilities

- National Science Foundation Director Arden Bement visits for “NSF Day” at ORNL
- Research Centre Jülich, led by Achim Bachem, chairman of the board of directors to discuss research collaboration

Arden Bement

- Delegation of seven from Japan Atomic Energy Agency, led by agency President Toshio Okazaki
- Hisham Hidmi, a visiting Fulbright Scholar at Vanderbilt University from Al-Quds Open University in the West Bank city of Nablus



NCCS Staffers Reach Out to Community

Space Institute, community group hear about center's work

- NCCS Director Buddy Bland speaks at the UT Space Institute in Tullahoma
- Bland discusses NCCS systems and plans for the future, as well as the history of high-performance computing
- Bobby Whitten, User Assistance and Outreach Group, speaks to Friends of Oak Ridge National Laboratory, a group of retirees and others interested in the Laboratory's research

*Buddy
Bland*



ORNL to Host Exascale Town Meeting

- ORNL to host 2-day town hall meeting May 17 and 18
- 10-year DOE Office of Science initiative aims to leverage recent gains in computing
- Focus areas include climate, renewable energy, nuclear energy, and astrophysics
- ORNL event is the second of three, with one held at Lawrence Berkeley National Lab and one planned at Argonne National Lab



Researchers look to build on dramatic gains in computing

Network Upgrade Helps Researchers Get Data In and Out of NCCS

Links to ESnet and Internet2
boosted to 10 gigabits

- NCCS upgraded its network connection April 11
- Center now has two 10 gigabit connections to ESnet and Internet2
- Connections replace a single 1 gigabit connection

