24 Years Unleashing the Power of HPC

SC2012

2012 Chair
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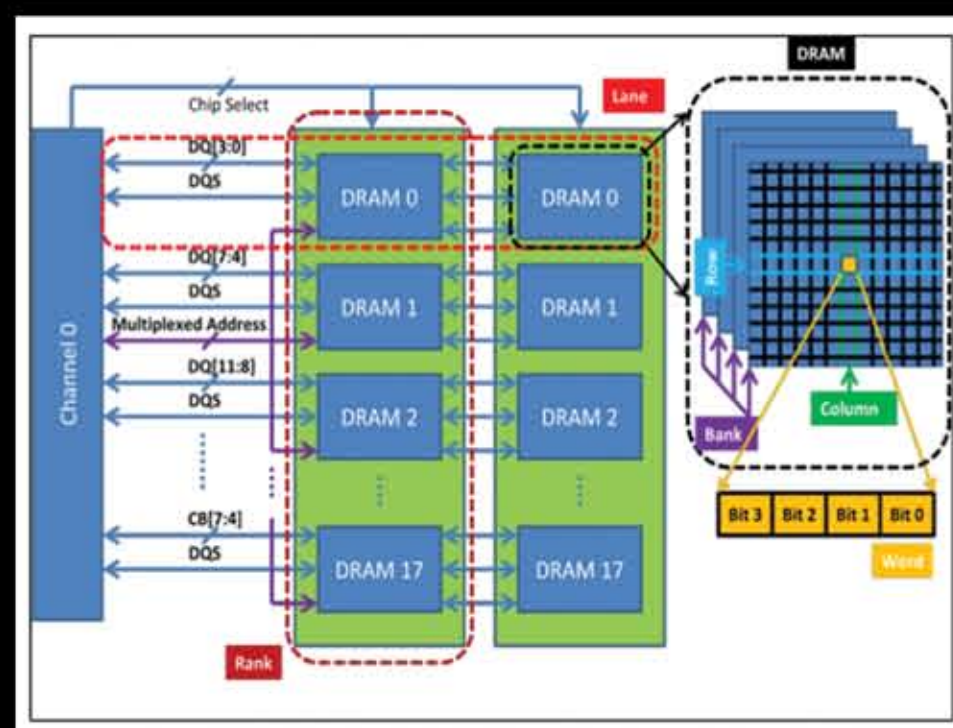**SC12**
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Figure 1. A simplified logical view of a single channel of the DRAM memory subsystem on each node in the Jaguar system.
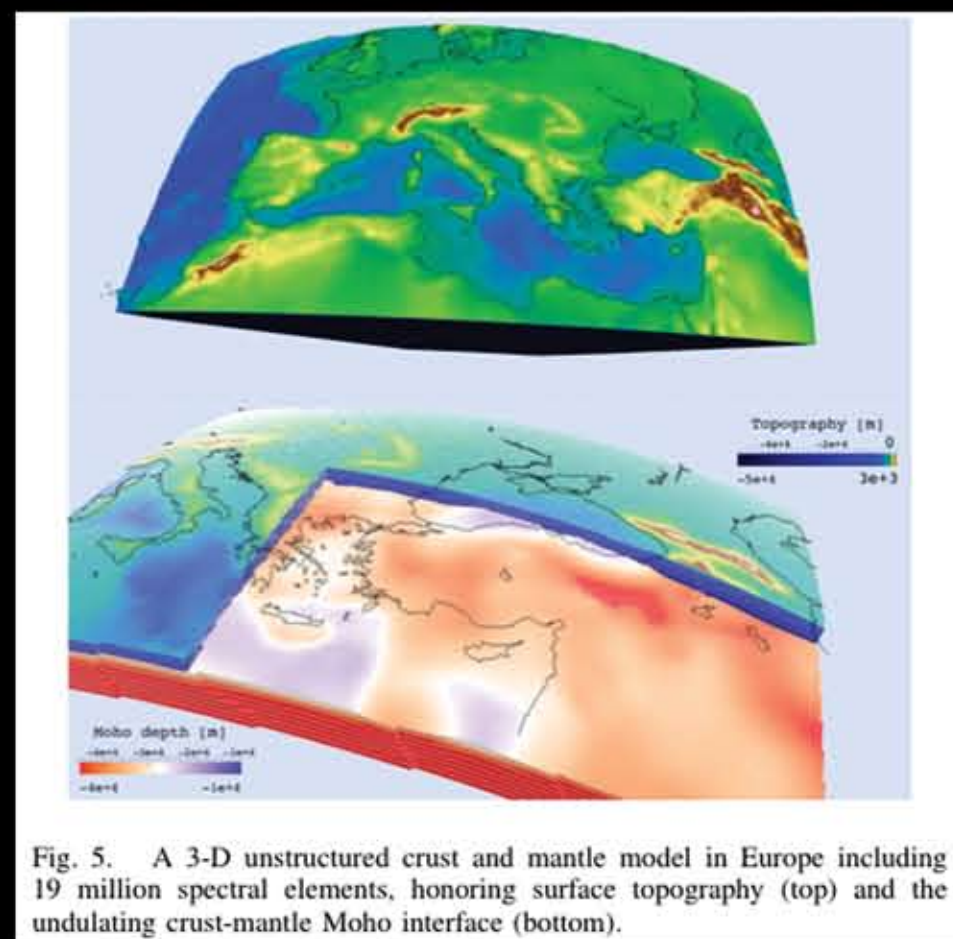

Fig. 5. A 3-D unstructured crust and mantle model in Europe including 19 million spectral elements, honoring surface topography (top) and the undulating crust-mantle Moho interface (bottom).

2012

Notable Systems first mentioned this year in the proceedings:
• TITAN
• Sequoia
• Stampede
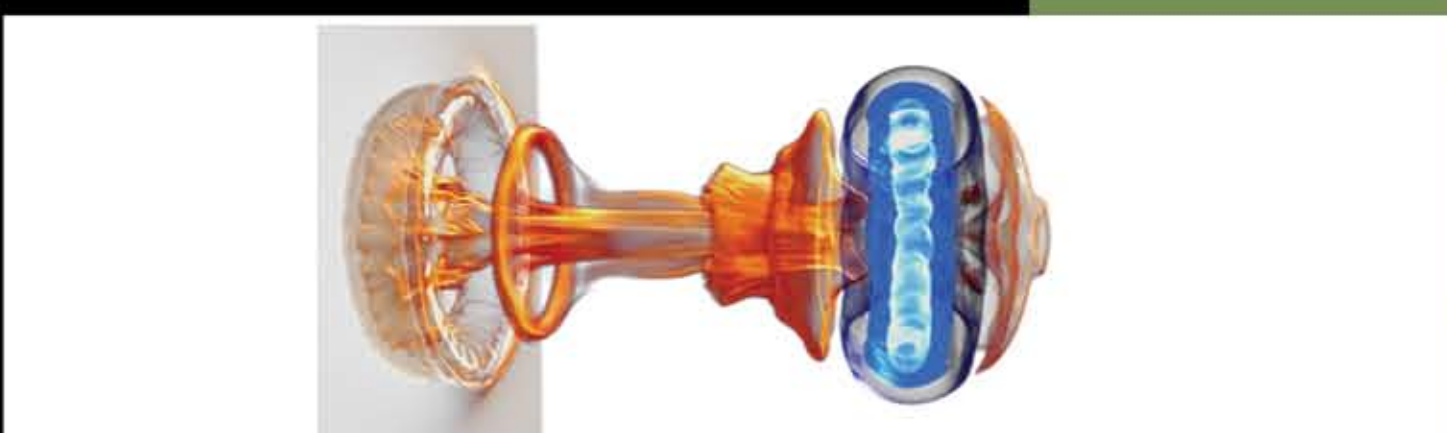• Mira

Notable Processors/Architectures:
• Intel Xeon Phi (first Intel MIC)
• Cray Cascade
• SGI UV 2
• Blue Gene/Q
• GRAPE-8

Noteworthy Architecture Topics:
• DRAM Failures
• Transactional Memory
• Exascale

Notable Applications:
• First-Ever Full Observable Universe Simulation
• Peta-Scale Lattice Quantum Chromodynamics
• High Performance Radiation Transport Simulations

Volume rendering of the density field of SBI at M=3 and $\tilde{t}=2$ showing the PVR and the SVR. High/low density is shown in orange/blue.

Figure 1.   A Cascade blade which consists of 8 Xeon sockets, organized as 4 dual-socket nodes, and a single Aries ASIC.
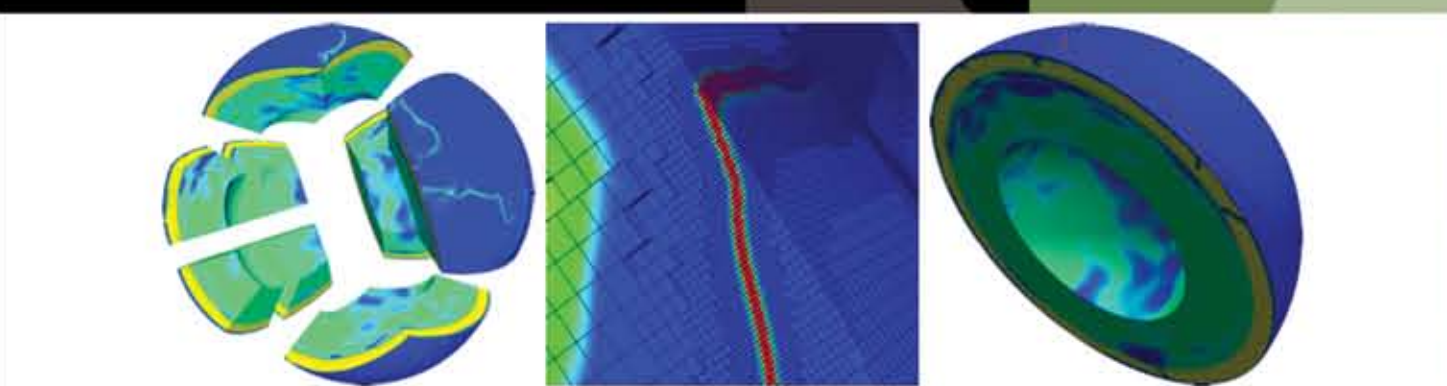

Fig. 5.   Spherical shell consisting of 24 octrees (left), slice through the mesh (right) and zoom showing adaptively refined mesh (middle). The color depicts the logarithm of the coefficient field coming from the simulation of global mantle flow, where the narrow red zones with lowest viscosity correspond to tectonic plate boundaries. The 6 order of magnitude variation in the coefficient is resolved on the mesh with 23B finite elements corresponding to octree levels between 9 and 19 on 64K processes.

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