Pacific Northwest National Laboratory

The Frontiers in Computational and Information Sciences Seminar Series presents

Architecture-Aware Algorithms and Software for Scalable Performance and Resilience on Heterogeneous Architectures

Speaker: Professor Jack Dongarra

University of Tennessee Distinguished Professor and ORNL Distinguished Research Staff

- Date: January 24, 2011
- Time: 1:00 – 2:00 pm
- Location: EMSL Auditorium
- Contact: Monica Moffett, 509-375-2561 or monica.moffett@pnl.gov

In this talk, Professor Dongarra will examine how high performance computing has changed over the last 10 years and look toward the future in terms of trends. These changes have had and will continue to have a major impact on software. Some of the software and algorithm challenges have already been encountered, such as management of communication and memory hierarchies through a combination of compile--time and run--time techniques, but the increased scale of computation, depth of memory hierarchies, range of latencies, and increased run--time environment variability will make these problems much harder. He will look at five areas of research that will have an importance impact in the development of software and algorithms, focusing on redesign of software to fit multicore architectures; automatically tuned application software; exploiting mixed precision for performance; the importance of fault tolerance; and communication avoiding algorithms.

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