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HPC at the Petascale and Beyond

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IBM's Blue Gene/L system had demonstrated that it is now feasible to run applications at sustained performances of 100's of teraflops. The next generation Blue Gene/P system is designed to scale up to a peak performance of 3.6 Petaflops. This talk will look at some of the key application successes already achieved at the 100TF scale. It will then address the emerging petascale architectures and look at the challenges which arise as the HPC world now starts to consider designing 100 Petaflop and Exaflop Systems. These challenges are very significant and include power, memory bandwidth, network bandwidth, reliability, systems software, and applications.

Summary

James Sexton:

(B.A. [Mod.], Theoretical Physics, Trinity College Dublin, 1980; Ph.D., Theoretical Physics, Columbia University, 1986) is Research Staff Member at the Thomas J. Watson Research Center of IBM Corporation, where he is responsible for applications for IBM Blue Gene architectures. Dr. Sexton has had prior appointments at Fermilab (1984-1986), at the Princeton Institute for Advanced Studies (1986-1988), at IBM T. J. Watson Research Center (1988-1991).

Prior to his arrival at IBM in 2004, Sexton was Professor of Physics at Trinity College Dublin. Among his honors, he is a multiple winner of the Gordon Bell Prize in high-performance computing (two awards in 2006, one in 2005) in collaboration with LLNL. Although a theoretical high-energy physicist by background, his areas of interest cover broad ground. His output includes publications in quantum field theory, quantum chromodynamics (QCD), statistical mechanics, computational physics, molecular dynamics, and medicine.

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