Speaker:

- Jeffrey S. Vetter, Oak Ridge National Laboratory, http://ft.ornl.gov/~vetter/

Title:

Preparing for Extreme Heterogeneity in High Performance Computing

Abstract:

While computing technologies have remained relatively stable for nearly two decades, new architectural features, such as heterogeneous cores, deep memory hierarchies, non-volatile memory (NVM), and near-memory processing, have emerged as possible solutions to address the concerns of energy-efficiency and cost. However, we expect this 'golden age' of architectural change to lead to extreme heterogeneity and it will have a major impact on software systems and applications. Software will need to be redesigned to exploit these new capabilities and provide some level of performance portability across these diverse architectures. In this talk, I will sample these emerging memory technologies, discuss their architectural and software implications, and describe several new approaches (e.g., domain specific languages, intelligent runtime systems) to address these challenges.

Bio:

Jeffrey Vetter, Ph.D., is a Distinguished R&D Staff Member at Oak Ridge National Laboratory (ORNL). At ORNL, Vetter is the founding group leader of the Future Technologies Group in the Computer Science and Mathematics Division, and the founding director of the Experimental Computing Laboratory (ExCL). Vetter also holds joint appointment at the University of Tennessee-Knoxville. Vetter earned his Ph.D. in Computer Science from the Georgia Institute of Technology. Vetter is a Fellow of the IEEE, and a Distinguished Scientist Member of the ACM. In 2010, Vetter, as part of an interdisciplinary team from Georgia Tech, NYU, and ORNL, was awarded the ACM Gordon Bell Prize. In 2015, Vetter served as the SC15 Technical Program Chair. His recent books, entitled "Contemporary High Performance Computing: From Petascale toward Exascale (Vols. 1 and 2)," survey the international landscape of HPC. See his website for more information: https://ft.ornl.gov/~vetter/.