

FUTURE TECHNOLOGY FOR SUPERCOMPUTING: NEW OPPORTUNITIES FOR COMPUTATIONAL SCIENCE

Jack Wells

Supercomputing has made incredible progress over the past five decades. This progress has been frequently summarized and discussed in terms of the exponential increase in processing power available to users of high-performance computing (HPC) centers. Several recently published national reviews and reports of supercomputing find that this exponential increase in processing power is likely to continue in the near to mid-term through evolutionary changes in computing technology. Even evolutionary change in computing technology may be disruptive to the work cycle of research and development groups in computational science. Such disruption often is realized in terms of effort and expense in porting and optimizing codes to new computer architectures in order to realize acceptable performance. Such change can be anticipated and incorporated into the future plans of HPC centers and the developers of scientific applications software alike. Ideally, it will be the requirements and goals of the scientific community that shapes and informs the evolution of computer technology for scientific computing and computational science. In this talk, we will discuss concepts emerging for next-generation, future computing architectures, and other recent developments in scientific computing, and the new opportunities these technologies avail for progressing toward a more efficient utilization for science of the exponentially growing computing technology.