



March 10, 2014

Dr. Patricia M. Dehmer  
Acting Director, Office of Science  
U.S. Department of Energy  
Washington, DC, 20585

**Report of the ASCAC Subcommittee for the Top Ten Exascale Research Challenges**

Dear Dr. Dehmer,

On behalf of the Advanced Scientific Computing Advisory Committee (ASCAC) and its Subcommittee for the Top Ten Exascale Research Challenges, chaired by Robert Lucas of the University of Southern California Information Sciences Institute, I am pleased to convey our final report in response to your charge of July 29, 2013. This report was accepted unanimously by ASCAC at our February 10, 2013 meeting.

The subcommittee - experts covering all aspects of high performance computing systems, coming from industry, academia, and laboratories – have studied the technical challenges of exascale computing, the research needed to address them, and possible paths forward for the successful development of exascale systems that meet the needs of the Office of Science.

We hope that this report will be useful to you, the Office of Science, and DOE in planning and executing the next phases of the advanced computing program.

Sincerely,

A handwritten signature in black ink that reads "Roscoe C. Giles".

Dr. Roscoe C. Giles  
Chair, Advanced Scientific Computing Advisory Committee  
Department of Electrical and Computer Engineering &  
Center for Computational Science  
Boston University

CC: Dr. Steven Binkley  
Associate Director, Office of Advanced Scientific Computing Research  
Office of Science, Department of Energy

Christine Chalk,  
ASCAC DFO  
Office of Advanced Scientific Computing Research  
Office of Science, Department of Energy