The Role of Computational Science in Energy Efficiency and Renewable Energy

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Abstract

The National Renewable Energy Laboratory (NREL) in Golden, Colorado is the nation's premier laboratory for renewable energy and energy efficiency research. The laboratory's mission is to develop renewable energy and energy efficiency technologies and practices and advance related science and engineering to address the nation's energy and environmental goals.

A new computational sciences initiative at NREL seeks to dramatically increase the computational expertise and capabilities of the Lab. Integrating numerical simulation and information technology into the laboratory research agenda presents unique challenges and opportunities. In this talk we will discuss the wide variety of scientific research being pursued at the laboratory and the role that computational science can play in helping to improve energy efficiency research and to dramatically reduce the cost of exploiting renewable energy technologies. This talk will also discuss challenges faced in developing large numerical applications for parallel high performance computing systems and architectural support for numerical methods of choice.

NREL’s web page is: http://www.nrel.gov/ .

Steve Hammond is the Computational Sciences Director at the National Renewable Energy Laboratory (NREL). Prior to joining NREL in March 2002, Steve spent nine and a half years at the National Center for Atmospheric Research in Boulder, CO. During the last six years at NCAR Steve managed the computational science section of the Scientific Computing Division.

Before joining NCAR Steve was a Post Doc at the European Center for Advanced Scientific Computing in Toulouse, France; Visiting Research Associate at the Research Institute for Advanced Computer Science, NASA Ames Research Center, Moffett Field, CA; and Computer Scientist at the Corporate Research and Development Center, General Electric Co., Schenectady, New York. His areas of expertise include parallel numerical computing, graph partitioning and mapping, parallel algorithms, interconnection networks, and strategic planning.