ABSTRACT

The Department of Energy’s Office of Basic Energy Sciences (BES) supports fundamental research that provides the foundations for new energy technologies and supports DOE missions in energy, environment, and national security. The research crosses the full spectrum of materials sciences and engineering with a focus on understanding, predicting, and ultimately controlling matter and energy at electronic, atomic, and molecular levels. In addition, BES is the home for national user facilities for x-ray, neutron, nanoscale sciences, and electron beam characterization that serve over 10,000 users annually, including a significant population of materials sciences and engineering users.

This overview will review the current BES-MSE research activities and will discuss future directions and opportunities in materials sciences to support energy generation and use as well as cross-cutting grand challenge research.

BIOSKETCH

Linda L. Horton is the Director of the Materials Sciences and Engineering Division, Office of Basic Energy Sciences (BES) in the Office of Science, U. S. Department of Energy (DOE). The Division supports a broad-based research program engaged in fundamental studies of materials sciences and engineering. The research seeks to understand the atomistic basis of materials properties and how to make materials perform better at acceptable cost through innovative materials design, synthesis, and processing. The program fulfills DOE missions through research that leads to improved materials for energy efficiency, environmental acceptability, and energy generation, conversion, transmission, and utilization.

Prior to joining BES, she was the Director of the Center for Nanophase Materials Sciences at Oak Ridge National Laboratory, one of the five DOE national user facilities for nanoscale science research. Her personal research emphasized applications of electron microscopy to materials science problems including investigations of the effects of ion implantation and neutron irradiation and studies of the growth and characterization of diamond thin films. She is a Fellow of ASM International, and has served on a number of national and international advisory committees and as an officer of the Materials Research Society and of the Microscopy Society of America, Trustee of ASM International, and Vice-Chairman of the DOE Basic Energy Sciences Advisory Committee. Her Ph.D. is in Materials Science from the University of Virginia.