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Superconductivity: Challenges and Opportunities[1]

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As part of its effort to define transformational opportunities for fundamental research in energy security, the Department of Energy's Office of Basic Energy Sciences held a workshop on Basic Research Needs for Superconductivity. The workshop identified a number of materials grand challenges and priority research directions for transforming the power grid to meet the needs of the 21st century. The prospect of moving from materials by serendipity to materials by design and of advancing the frontiers of epitaxial science to yield higher performing nano-structured architectures are two of the these challenges that could impact superconductivity research specifically and materials research more broadly. In this talk we highlight recent technical successes that motivate and illustrate these opportunities. We also discuss the science that might be necessary to accomplish these goals in the hopes of nucleating further community input and engagement. In collaboration with Wai Kwok, Argonne National Laboratory.

[1]http://www.sc.doe.gov/bes/reports/files/SC_rpt.pdf