2014 Spring MRS, San Francisco
Wednesday, 23 April

Session T: Superconducting Materials: From Basic Science to Novel Technology

Plenary Overviews – Multidisciplinary Approaches

2:30 PM - *T7.03

Challenges Confronting High Temperature Superconducting Materials: From Nanoscale Theories to Exascale Energy Applications

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We review the present state of the understanding and application of high temperature superconductor materials ranging from attempts to explore pairing mechanisms on the energy scale of a few milli-electron-volts to their use to embody terra-kwh continental wide deployment within the electricity enterprise. Examples include the use of density functional theory to study the relative roles of spin-fluctuation and/or lattice vibration induced Cooper pairing to modelling the incorporation of long distance HTSC transmission cables within the same natural gas pipeline rights-of-way infrastructure now emerging worldwide.