

COLLOQUIUM

Correlated Electrons: The Dark Energy of Condensed Matter

Laura H. Greene

National MagLab and Florida State University

President, American Physical Society

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The nearly 80-year-old “correlated electron problem” remains largely unsolved, with one stunning success being conventional superconductivity. There still exists dozens of families of superconductors that we do not understand, classified as unconventional, including the high-temperature cuprate superconductors. These materials exhibit a ubiquitous phase diagram, with regions in which strongly correlated electron states exist, whose properties remain unexplained. After a short introduction to the MagLab, I will define conventional and unconventional superconductivity, and how many of us believe that understanding their enigmatic electronic phases will lead us to the predictive design of better superconductors. I will also explain the analogy in my talk title.