

MAR17-2016-020214

Abstract for an Invited Paper
for the MAR17 Meeting of
the American Physical Society

Unconventional electronic properties of conventional Kondo insulator

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The physics of samarium hexaboride – a narrow gap strongly correlated semiconductor discovered almost 50 years ago – continues to inspire experimental and theoretical research. Much of the recent experimental work seeks to test the theoretical proposal that samarium hexaboride could be a prototypical example of the first correlated Z_2 topological Kondo insulator. In this talk I will first outline the main ideas which lead to realization that samarium hexaboride becomes a topological Kondo insulator below a certain temperature. I will discuss recent theoretical works which propose several experiments helping to prove that the metallic surface states in samarium hexaboride are indeed topological. Finally, I will review most recent experiments which challenge our current understanding of physics of this fascinating material.