Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Strong correlations in Kondo topological insulators: Two-dimensional heavy fermions, and beyond PREDRAG NIKOLIC, George Mason Univ — Samarium hexaboride (SmB6) is a candidate topological insulator with strong electron correlations. Empowered by the time-reversal (TR) symmetry and topology, the low-energy surface states of hybridized samarium's d and f orbitals can exhibit a rich two-dimensional heavy-fermion phenomenology. This talk will survey several interesting possibilities for correlated surface states, which depend on microscopic surface conditions. A pronounced participation of the f orbitals is expected to create a heavy-fermion Dirac metal, possibly unstable to spin density waves, superconductivity, or exotic Mott insulators (e.g. algebraic and non-Abelian spin liquids). The opposite limit of localized magnetic moments can produce a non-Fermi liquid of d electrons that exhibits two-dimensional quantum electrodynamics. Ultrathin films made from topological Kondo insulators can host lattices of SU(2) vortices, which need not break the TR symmetry. Landau-Ginzburg theory and numerical model calculations reveal the nature and stability of such vortex lattices, while field theory arguments predict that their quantum melting could yield novel incompressible quantum liquids with non-Abelian fractional excitations.

Predrag Nikolic
George Mason Univ

Date submitted: 05 Nov 2015 Electronic form version 1.4