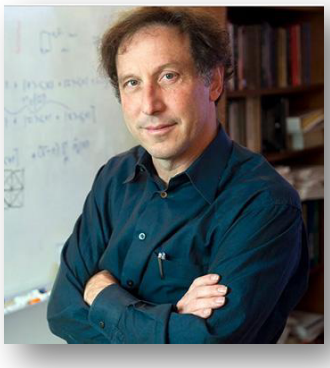
UCLA Department of Physics & Astronomy

COLLOQUIUM

Thursday, February 2 at 4 p.m.
1-434 PAB

Metals, Strange Metals, and Bad Metals

Steven Kivelson
(Stanford University)



The simplicity of the Fermi-liquid based theory of "normal metals" hides the fact that the existence of a Fermi surface underlies some of the most spectacular emergent phenomena in the natural world. Recently, a host of metallic behaviors have been identified that apparently cannot be accounted for in the framework of the conventional theory of metals – observed in material systems referred to as "strange metals," "bad metals," and various other names evocative of one or another anomalous property. Examples of systems in which unconventional metallic behaviors have been reported include the cuprite high temperature superconductors, twisted bilayer graphene, systems undergoing a quantum superconductor-to-metal or a metal-to-insulator transition, and near quantum-critical metals. This talk will start with a high-level perspective on the theory of conventional metals, followed by a discussion of what makes the observed features of these unconventional metals so intriguing, ending with thoughts concerning some of the underlying physics implied by a subset of these observations.

Refreshments at 3:30 p.m. on the PAB Patio. Undergraduates Welcome!