



## PHYSICS AND ASTRONOMY COLLOQUIUM

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## “More is Different:’ Many-Body Physics at the Nanoscale”

### Abstract

In 1972, Phil W. Anderson wrote an influential article in Science magazine entitled "More Is Different". In this article, Anderson (who would win the Nobel Prize in physics five years later) wrote: "The behavior of large and complex aggregates of elementary particles, it turns out, is not to be understood in terms of simple extrapolation of the properties of a few particles. Instead, at each level of complexity entirely new properties appear and the understanding of the new behaviors requires research which I think is as fundamental in its nature as any other."

Over forty years later we can test this statement with unprecedented accuracy. One important example is the Kondo effect, the many-body screening of a local spin by a continuum of electrons. Kondo-related phenomena has been observed in several different set-ups: semiconductor quantum dots, magnetic adatoms on metallic surfaces, and, more recently, graphene. The latter case is particularly intriguing, as there are seemingly conflicting results coming out of experiments. I will discuss a possible scenario in which the interplay of disorder and many-body physics offer a consistent description compatible with the experimental data.

Wednesday, February 18, 2015

3:30 p.m.

Bob Wright Centre

Room A104