Old Dominion University
Department of Physics

Colloquium

Thursday February 22, 2018

"Materials Approach to Emergent Phenomena in Condensed Matter"

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Abstract: Emergent phenomena in condensed matter physics, which result from cooperative effects and thus cannot be predicted from the properties of individual electrons, extend beyond the realm of strongly correlated electron systems. The recent examples include topological materials such as Dirac and Weyl semimetals. In this talk, I will present a snapshot of my broader strategy in the search for the emergent phenomena in such topological materials. I will first start by reporting my recent studies on Weyl semimetal NbAs. A Weyl semimetal is a conductor whose low-energy bulk excitations are Weyl fermions. I will present the experimental signature of an emergent behavior of Weyl fermions in NbAs observed in magnetotransport measurements. In the second part, I will talk about my new approach of searching for emergent properties by combining topological features and magnetic textures in a single material. In an attempt to follow this direction, I have found an unusual anomalous Hall effect in a noncentrosymmetric antiferromagnet $CoNb_3S_6$, which we attribute to a novel interplay between the magnetic and electronic degrees of freedom.

Presentation: OCNPS 200 @ 12:30 pm
Refreshments: OCNPS Atrium @ 12:15 pm

All interested persons are cordially invited to attend.