

Alexander Palmer

Graduate Institution: University of Chicago

Graduate Discipline: Experimental Condensed Matter Physics

Hometown: Dallas, TX

Relevant SC Research: Basic Energy Sciences



Research Interest:

My research interests focus on the study of quantum phase transitions. In the low temperature limit, order-disorder phase transitions are driven by quantum, rather than thermal, fluctuations. Such quantum phase transitions involve fundamentally different physics than their classical counterparts and introduce the opportunity to understand new physics by measuring new critical exponents and scaling laws. I currently study two quantum phase transitions in two model systems: Chromium and Nickel Disulfide

Elemental chromium has spin-density-wave and charge-density-wave transitions that smoothly suppressible to the low temperature limit. The breakdown of the itinerant antiferromagnetic BCS ground state suggests possible connections to the onset of superconductivity in rare earth cuprates. Nickel Disulfide is a Mott-Hubbard material without strong structural instability due to the localization of charge. I am studying the critical behavior of the metal-insulator transition in NiS₂.

About Me:

I received my BS in Physics from The University of Texas at Dallas and MS

from The University of Chicago. I am currently a Ph.D. student at the University of Chicago working in experimental condensed matter physics. I am interested in quantum phase transitions, magnetic ordering, superconductivity, and other emergent phenomena. I enjoy fundamental research and hope to continue in a research-oriented career in an academic or national laboratory setting. At Chicago I enjoy book and journal clubs as well as racquetball and biking. Outside school, I enjoy outdoor activities and volunteering with after school organizations.



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