

Colloquium Notice

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Unconventional Magnetism: Ginzburg-Landau Theory of Non-Collinear Magnetic Ordering in Multiferroics

Multiferroics are materials that display an amazing coexistence and interplay of long range ferromagnetic and ferroelectric orders. The magnetization (ferroelectric polarization) of these materials can be altered by applying an external electric (magnetic) field, such cross-correlations between the electric and the magnetic phenomena leading to intense interest in the possibility of novel magnetoelectric devices. It was observed recently that the multiferroics that show the strongest sensitivity of polarization to an applied magnetic field are non-collinear spiral magnets. The spiral magnetic ordering, in which the local magnetization rotates around a direction in space (pitch vector), spontaneously breaks coordinate space inversion symmetry giving rise to the macroscopic polarization. With hints from the theories of some liquid crystals, which bear a family resemblance to these systems, in this talk I shall develop a Ginzburg-Landau description of this new class of materials. The resulting theory will allow us to explain as well as predict many unusual and outstanding experimental observations.

Monday

February 11, 2008

Starts at 12:15 PM

Coffee at 12:00 PM

Physics Conference Room, SB B326