

Area Seminar

Title Aspects of Quantum criticality in ferroelectrics

Date and 31/01/2014 16:00:00
Time

Speaker Dr. Nabyendu Das
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Area Theoretical Physics
Venue Room No. 469

Abstract Some insulating dielectric materials, namely quantum paraelectrics are found to be near a quantum phase transition. Examples include SrTiO₃, KTaO₃ etc. Using an effective theory, which includes transverse optic phonons near zone centre as the most relevant degrees of freedom, a self consistent approach is proposed to explain the low temperature dielectric behavior of these materials. Using finite temperature scaling near a quantum critical point, $1/T^2$ behavior of the paraelectric susceptibility is predicted. The theory is extended to describe other systems where quantum paraelectric fluctuations are coupled to anti-ferromagnetic fluctuations and quenched disorder.