Physics Colloquium

Thursday, May 3, 2018

Jean Toulouse

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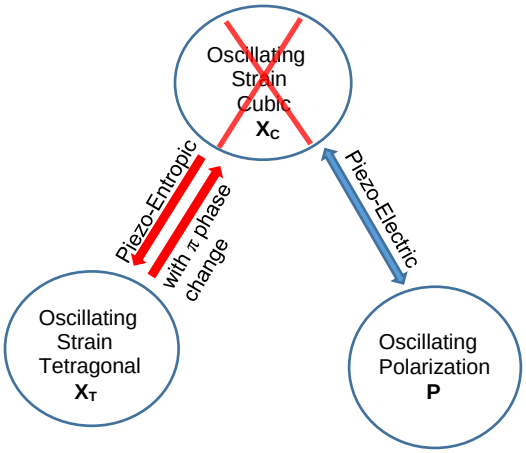
"Coherently Coupled Resonances in Relaxor Ferroelectrics"



Complex oxides exhibit a wide variety of new dynamical phenomena, which are related to the co-existence of local or intermediate range order and long range order. In the present talk we focus on "relaxor ferroelectrics", complex oxides that develop local polarization in the form of polar nano-regions (PNRs) that behave as giant dipoles. But because of their lack of inversion symmetry, these PNRs are also piezoelectric and can be excited locally into vibrational resonances, which in turn drive macroscopic resonances. They can simultaneously "relax" between different orientations. The interaction of their relaxation and resonances give rise to quite complex and unexpected dynamics, which surprisingly resembles the dynamics of certain atomic systems.

Prof. J. Toulouse received his MS and PhD from Columbia University (....and a BA in Economics from the University of Paris prior to that). He joined the Physics Department at Lehigh in 1984 and has been here ever since, except for several sabbatical leaves in Europe. In 1996-1997 he served as Program Director in the Condensed Matter Physics program at the NSF and in 1998-1999 was instrumental in the creation of the Center for Optics at Lehigh. His research program has been both in Condensed Matter Physics and in (Fiber) Optics. He has published over 160 papers between both fields of research.

4:10PM in Lewis Lab. 316

Refreshments at 3:45PM in LL. 317