

## Area Seminar

Title	Why do mean-field theories fail near the critical point and how does Wilson's renormalization group method go beyond that
Date and Time	31/12/2013 16:00:00
Speaker	Navinder Singh
	PRL
Area	Theoretical Physics
Venue	
Abstract	<p>Mean field theories are good qualitative descriptors of the phase transition behaviour. But all mean-field theories (including Landau's theory) fail at the critical point (the problem of large correlation length). The problems with large correlation length in quantum many-body systems are the hardest problems known in theoretical physics (both in condensed matter (like high Tc cuprates) and in particle physics (like QCD)). It was Ken Wilson's physical insights and his powerful mathematical skills that opened a way to the solution of such hard problems. With above in perspective, we will address the following questions: Why do all the mean-field theories fail near the critical point? How does Wilson's program go beyond all the mean-field theories? What are physical meanings of various kinds of fixed points? What is emergence and universality? And what is the origin of universality? (sequel of: Thermodynamical Phase transitions, the mean-field theories, and the renormalization (semi)group: A pedagogical introduction(*))</p> <p>(*) This presentation is our tribute to Ken Wilson (the pioneer of the renormalization group) who expired few months ago.</p>