

**INDIAN ASSOCIATION FOR THE CULTIVATION OF
SCIENCE**

2A&B, Raja S.C. Mullick Road, Jadavpur, Kolkata-700032, India

Seminar Notice

Org. by

Theoretical Physics Department

Title:	Lattice Effects on Nematic Quantum Criticality in Metals
Speaker:	Indranil Paul, Laboratoire Matériaux et Phénomènes Quantiques, Université Paris Diderot & CNRS, France
Date:	September 5, 2017 (Tuesday)
Time:	12:00 noon
Venue:	Theoretical Physics Seminar Room (C406), 3rd Floor, Centenary Building, IACS
Abstract:	Understanding the properties of a metal close to a nematic quantum critical point is an essential step towards our quest to comprehend the low temperature properties of several correlated electron systems such as the iron and the copper based high temperature superconductors. While this topic has been studied extensively in the past, the influence of electron-lattice coupling, which is invariably present, has not been examined adequately. In this work we show how, even if the nematic transition is established by electron-electron interaction, symmetry allowed electron-lattice interaction is a relevant perturbation that changes the quantum critical properties qualitatively. In particular, as a result of this interaction the critical fluctuations are mostly cut off by the non-critical lattice shear modes. The thermodynamics remain Fermi liquid type even right at the quantum critical point, while, depending on the Fermi surface geometry, either the entire Fermi surface stays cold, or at most there are hot spots. We also discuss how this physics affects superconductivity in the vicinity of the nematic quantum critical point. Ref: I. Paul and M. Garst, arXiv:1610.06168.

All are cordially invited to attend the seminar