

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:	Critical elasticity and superconductivity in the iron based systems
Speaker:	Indranil Paul, Laboratoire Matériaux et Phénomènes Quantiques, Université Paris Diderot, France
Date:	June 19, 2018 (Tuesday)
Time:	4:00 p.m.
Venue:	Theoretical Physics Seminar Room (C406), 3rd Floor, Centenary Building, IACS
Abstract:	In unconventional superconductors an important question is whether superconducting transition temperature T_c is boosted in the vicinity of a nematic quantum critical point (QCP). While existing theories have predicted significant T_c enhancement, experiments on doped FeSe clearly show that T_c is unaffected by the QCP. We provide an explanation of this observation based on effects of the interaction between the electrons and the acoustic phonons of the lattice. Including this interaction restricts criticality only to certain high symmetry directions due to the presence of non-critical shear modes that necessarily exist in a crystalline solid. This physics, in conjunction with the presence of a non-nematic pairing interaction, possibly of magnetic origin, leads to a T_c that is unaffected by the nematic QCP. Our theory emphasizes the importance of electron-phonon interaction to understand the physical effects of critical nematic fluctuations. References: [1] D. Labat and I. Paul, 2017, Phys. Rev. B 96, 195146. [2] I. Paul and M. Garst, 2017, Phys. Rev. Lett. 118, 227601.

All are cordially invited to attend the seminar