INDIAN ASSOCIATION FOR THE CULTIVATION OF SCIENCE
2A & 2B, Raja S.C. Mullick Road, Jadavpur, Kolkata-700032, India

Seminar Notice

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School of Physical Sciences

Title:	**Electronic structure and nematic fluctuation in iron-based superconductor**
Speaker:	**Saheli Sarkar, Institut de Physique Theorique(IPhT), CEA Saclay, Paris, France**
Date:	**January 15, 2019 (Tuesday)**
Time:	**4:00 p.m.**
Venue:	**Physics Seminar Room - C406,3rd Floor, Centenary Building, IACS**
Abstract:	Recently discovered iron-based superconductivity has been an intense field of research. Although there have been extensive studies to understand the microscopic origin of superconductivity in these materials, there is no consensus so far. An important approach to understand these materials, facilitated by significant advances in scanning tunneling spectroscopy(STS) has been to study the responses of these complex systems to defects and impurities. Modification of the local electronic structure arising from defects can be readily probed via STS, and provides unprecedented insight in to the correlation effects and the nature of the superconductivity. In this talk I will demonstrate that the differential conductance (dI/dV) measured via spectroscopic imaging scanning tunneling microscopy in the doped iron chalcogenide F eSe0.45T e0.55, possesses a series of characteristic features that allows one to extract the orbital structure of the superconducting gaps. This yields nearly isotropic superconducting gaps on the two hole-like Fermi surfaces, and a strong anisotropic gap on the electron-like Fermi surface. I will show that the pinning of nematic fluctuation by defects can give rise to dumbbell-like spatial structure of the impurity bound states, and explains the related C2 symmetry in the Fourier transformed differential tunneling conductance. In the last few minutes of the talk, I will very briefly touch upon my present works on the cuprate superconductor and materials exhibiting boundary modes.

All are cordially invited to attend the seminar