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

Seminar Notice

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Theoretical Physics Department

Title:	**Exploring quantum magnetism using Resonant Inelastic X- ray Scattering (RIXS)**
Speaker:	**Trinanjan Datta, Department of Chemistry and Physics, Augusta University, Augusta, GA, USA**
Date:	**June 27, 2018 (Wednesday)**
Time:	**4:00 p.m.**
Venue:	**Theoretical Physics Seminar Room (C406),3rd Floor, Centenary Building, IACS**
Abstract:	In recent years Resonant Inelastic X-ray Scattering (RIXS) has emerged as a powerful spectroscopic technique to study elementary excitations. In a typical RIXS process the energy of the incoming x-ray photon is resonantly tuned to match an element absorption edge. As incident radiation loses its energy and momentum to excitations inherent to the material, direct information on the dispersions of spin, orbital, lattice and other degrees of freedom can be obtained. RIXS can be utilized to probe magnetic correlations that give rise to both single electron spin-flip (magnon), two electron spin-flip (bimagnon), and three electron spin-flip (trimagnon) excitations. In this introduction to X-ray spectroscopy and quantum magnetism talk, I will present an interacting spin wave theory study of the multimagnon indirect RIXS excitation spectra of a spatially frustrated Jx–Jy–J2 Heisenberg model on a square lattice and an isotropic triangular lattice. Our theoretical calculations show that frustration, anisotropy, and damping of spin wave excitations play an important role in the interpretation of the indirect RIXS spectra of frustrated quantum magnets. I will also discuss our recent work on the effect of magnon-phonon and multi-band multi-channel RIXS excitation [1 – 4].

	[1] Indirect K-edge bimagnon resonant inelastic X-ray scattering spectrum of a-FeTe, Zengye Huang, Sean Mongan, Trinanjan Datta, Dao-Xin Yao, J. Phys.:Condens. Matter 29, 505802 (2017) . [2] Magnon-phonon coupling effects on the indirect K-edge resonant inelastic X-ray scattering spectrum of a 2D Heisenberg antiferromagnet, Zijian Xiong, Trinanjan Datta, Kenneth Stiwinter, Dao-Xin Yao, Phys. Rev. B 96, 144436 (2017). [3] Signatures of indirect K-edge resonant inelastic x-ray scattering on magnetic excitations in triangular lattice antiferromagnet, Cheng Luo, Trinanjan Datta, Zengye Huang, Dao-Xin Yao, Phys. Rev. B 92, 035109 (2015). [4] Two-peak structure in the Resonant Inelastic X-ray Scattering spectra of a spatially frustrated Heisenberg antiferromagnet, Cheng Luo, Trinanjan Datta, Dao-Xin Yao, Physical Review B, 89, 165103 (2014).

All are cordially invited to attend the seminar