TIFR Centre for Interdisciplinary Sciences
21 Brundavan Colony, Narsingi, Hyderabad 500075

Seminar

Chiral magnetism, skyrmions and nanoscale superparamagetism in oxide interfaces

Sumilan Banerjee

Weizmann Institute of Science, Israel

Atomically sharp oxide heterostructures exhibit a range of novel phenomena that do not occur in the parent bulk compounds. One of the prominent examples is the appearance of magnetism at the interface between the band insulators $LaAlO_3$ (LAO) and $SrTiO_3$ (STO). In the first part of my talk, I will discuss the possibility of realizing chiral magnetism and novel magnetic states, namely spirals and skyrmions, in oxide interfaces[1,2,3]. In the second part of my talk, I will report a new emergent phenomenon at another interface, $LaMnO_3/SrTiO_3$ (LMO/STO), in which an antiferromagnetic insulator abruptly transforms as a function of LMO thickness into a magnetic state exhibiting unusual nanoscale superparamagnetic dynamics[4]. I will discuss a theoretical model to understand this phenomenon.

[1] S. Banerjee, O. Erten and M. Randeria, Nature Physics 9, 626 (2013).
[2] S. Banerjee, J. Rowland, O. Erten and M. Randeria, Phys. Rev. X 4, 031045 (2014).
[3] J. Rowland, S. Banerjee and M. Randeria, arXiv:1509.07508 (2015).
[4] Y. Anahory et al., arXiv:1509.01895 (2015).

Monday, Nov 30th 2015

4:00 PM (Tea/Coffee at 3:45 PM)

Seminar Hall, TCIS