

Speaker: Dr. Rudra Sekhar Manna

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Date & time: Monday, December 18, 2017, 2:00 pm

Venue: C-404, Centenary building, Theoretical Physics Seminar Hall

Title: Low-dimensional frustrated quantum magnets in triangular and honeycomb lattices

Abstract:

Frustrated magnetism is one of the growing research interests in condensed matter physics. Theoretically different properties of these frustrated quantum magnets have been put forward a while back, but this field has become more interesting with the evidence of many recent motivating experiments. Frustration leads many different fascinating ground states by the coupling of spin, charge, and lattice degrees of freedom, e.g. Kitaev spin-liquid in spin-orbit coupled honeycomb iridates, spin-liquid in triangular and kagome lattices, valence-bond solid, Mott metal-insulator transition, Mott criticality, superconductivity as a function of temperature, magnetic field, and pressure. In my talk, I will discuss a phase transition like behavior in κ -(ET)₂Cu₂(CN)₃ - Mott insulating quasi-2D organic charge-transfer salts in triangular lattices, although it is proposed to be a spin-liquid [1] and the critical behavior of the endpoint of the Mott transition in κ -(ET)₂Cu[N(CN)₂]Cl [2]. Results of β -Li₂IrO₃, a 3D hyper-honeycomb where a spin-liquid state might be realized under hydrostatic pressure although at ambient pressure the material displays a complex antiferromagnetic ordering which is stabilized by the Kitaev interaction, will be discussed.

[1] E. Gati, M. Garst, R. S. Manna, U. Tutsch, B. Wolf, L. Bartosch, H. Schubert, T. Sasaki, J. A. Schlueter, and M. Lang, Science Advances 2, e1601646 (2016).

[2] R. S. Manna, M. Souza, A. Brühl, J. A. Schlueter, and M. Lang, Physical Review Letters 104, 016403 (2010).