

ICTS Seminar

Title : Unifying Competing Orders in Two Dimensional Quantum Magnets via QED3

Speaker : Ashvin Vishwanathan, Harvard University, USA

Date : Thursday, 27 December 2018

Time : 11:00 AM

Venue : Emmy Noether Seminar Room, ICTS Campus, Bangalore

Abstract : Quantum magnets provide the simplest example of strongly interacting quantum matter, yet they continue to resist a comprehensive understanding in $D>1+1$ dimensions. Here we argue that in two spatial dimensions ($D=2+1$) the Dirac spin liquid (DSL), a version of Quantum Electrodynamics (QED3) provides a promising unifying description of quantum magnets on various lattices. In addition to photons and Dirac fermions (spinons), its excitations also include magnetic monopoles that drive confinement. By calculating the complete action of symmetries on monopoles on different lattices, we address previously open key questions including the stability and experimental/numerical signatures of these states and their nearby ordered phases. Time permitting, I will explain how the monopole quantum numbers are simply related to topological properties of the spinon bands.

[arXiv:1811.11186](#)

[arXiv:1811.11182](#)