

CONDENSED MATTER THEORY SEMINAR

Subject: **A functional renormalization group approach to the quantum XY model**

Speaker: **Prof. Adam Rançon, Laboratoire de Physique des Lasers, Atomes et Molécules, Université de Lille**

Date & time: **Friday, October 26th, 2018 at 3.15 p.m.**

Venue: **Seminar room 1.114**

In this talk, I will present a recent application of the lattice functional renormalization group (FRG) to quantum XY spin models using a mapping to hardcore bosons. This mapping allows for the reinterpretation of the spontaneous magnetization in spin systems as the Bose condensation of magnons, and gives a natural framework to implement the lattice FRG. I will show how the FRG can take the hardcore constraint into account exactly, and will discuss the simplest approximation schemes. The results are in good agreement with Monte-Carlo simulations in two and three dimensions, and we show how the phase diagram and the thermodynamics can be reinterpreted at low densities using Bogoliubov theory.