

## CONDENSED MATTER THEORY SEMINAR

Subject: **“Completing the square” in frustrated magnets**

Speaker: **Prof. Yasir Iqbal (IIT Madras, Chennai, India)**

Date & time: **Thursday, December 15<sup>th</sup>, 2022 at 2 p.m.**

Venue: **Room 01.114 and online:**

Zoom Link:

<https://uni-frankfurt.zoom.us/j/96520912647?pwd=NWZneE5XQmlwZFJlUXJpcUhdNEtKQT09>

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Abstract:

Spin Hamiltonians which permit a “completing of squares” display some of the most intriguing phenomenon about which much remains to be explored. The classical Heisenberg antiferromagnet on the kagome and pyrochlore lattices being classic examples. In this talk, I will open a Pandora’s box in the guise of the innocuous looking FCC lattice, and show how the Heisenberg model with long-range interactions allows for completion of squares in nontrivial ways, each giving rise to nontrivial degenerate ground state manifolds. I will discuss how these findings set the stage for potential realization of classical and quantum spin liquids, as well as spin-nematic orders. I will conclude by presenting the pseudofermion functional RG approach which has shown promise in capturing the impact of quantum fluctuations in 3D frustrated magnets and present some results for the FCC lattice.