

Seminar Talk

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“Structural dynamics with strong quantum correlations and analog magnetic simulation with ultracold atoms in high-q cavities”

Abstract

In this talk, we will discuss theoretical aspects of emergent orders in crossed cavity systems[1] with possible realizations in the limit of strong and weak interactions.

In one setup we consider atoms in the quantum correlated regime [2] where we employ a newly developed light-matter DRMG algorithm. In the second setup, we consider analog emergent magnetic order that can be controlled in a mixed system using pseudo-spectral methods for simulations[3].

[1]F. Mivehvar, F. Piazza, T. Donner, and H. Ritsch, Cavity QED with quantum gases: new paradigms in many-body physics, *Advances in Physics* 70, 1–153 (2021).

[2]A. U. Ramírez-Barajas and S. F. Caballero-Benítez, Structural Dynamics and Strong Correlations in Dynamical Quantum Optical Lattices, *arXiv:2502.00588* (2025).

[3]B. Ríos-Sánchez and S. F. Caballero-Benítez, Control, competition and coexistence of effective magnetic orders by interactions in Bose-Einstein condensates with high-Q cavities, *arXiv:2412.07250* (2024)

Tuesday | 27.05.2025 | 11:00am

2S17 | ICT building