

OpenQMBP2023: New perspectives in the out-of-equilibrium dynamics of open many-body quantum systems



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Density wave ordering in a unitary gas with photon-mediated interactions

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I will present the realization of a quantum degenerate Fermi gas interacting simultaneously via unitary-limited contact interaction and long-range, photon mediated interaction induced by an optical cavity. We observe the onset of density-wave order above a critical strength of the photon-mediated interaction, and characterize the phase diagram as a function of both interactions type. This system is very promising for the investigation of the interplay of charge-density wave order with superfluidity with a fully controlled microscopic Hamiltonian. I will then present briefly the perspectives open in the mid-term for the realization of the SYK interactions in quantum gases.

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