DEPARTMENT OF PHYSICS AND ASTRONOMY

(Special Seminar)

Quantum dissipation in correlated matter

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Real quantum systems are seldom isolated. In many cases, a coupling to the environment is a source of decoherence, but it can also be a route to novel phases of matter. In this talk, I will explore different scenarios of system-bath interaction, for which the memory of the environment substantially affects the properties of the system. To this end, I will apply powerful quantum Monte Carlo methods which I have developed over the last years. I will consider a quantum spin chain coupled to a metallic substrate for which dissipation induces long-range antiferromagnetic order in the one-dimensional spin chain, which is otherwise prohibited by the Mermin-Wagner theorem. Moreover, I will explore how the retardation range of the memory kernel can induce novel phases in electron-phonon-coupled systems. I will also show how the semiclassical dynamics of a pumped electron-phonon chain can reproduce the long-time ringing of the phonon amplitude mode found in pump-probe experiments.

Monday, February 10, at 10:30 AM,
CSP Conference Room 322, Physics Building

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