



488th ASRC Seminar



Date: 13:30 - 15:00, 12th November

Location: Meeting room 103, ASRC Building

Speaker: Prof. Janez Bonca

(University of Ljubkijana, Slovenia)

Title: Numerical study of a lightly doped Mott insulator driven by a constant electric field

I will present a fundamental study of a single hole and two holes in the two dimensional t-J model and the t-J Holstein model driven away from the equilibrium by a constant electric field. Taking fully into account quantum effects we follow the time-evolution of systems from their ground state as the constant electric field is switched on at $t=0$, until they reach a steady state.

In the case of the t-J model we demonstrate that there exist three distinct regimes of the electric field (adiabatic, dissipative and the BO regime) which differ with respect to the real-time response. As a counterintuitive result, the dc current is shown to be maximal for a finite value of the electric field. When introducing relevant coupling to phonons, most of the gained energy from the electric field flows into magnon excitations.

We show that when driving a bound hole pair in the t-J model, the pair dissociates as soon as the electric field is strong enough to induce a steady-state current



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