

 Veljko Janković Upload Slides My Saved ScheduleLog out [Attend the Meeting](#)[On-site Experience](#)[Virtual Experience](#)[Schedule](#)[About](#)March 16–21, 2025,
Anaheim, CA and virtual[Schedule at a Glance](#)[Authors and Presenters](#)[Home](#) > [Schedule](#) > Focus Session MAR-N47[Focus Session](#) [March](#)

Precision Many-Body Physics III: Geometry, Topology, and Dynamics

3:00 pm – 6:00 pm, Wednesday March 19 // Session MAR-N47 //

 Anaheim Convention Center, 262B (Level 2)**Chair:** Johnnie Gray, Caltech**Topics:** [Computational Physics](#); [AMO Physics](#); [Condensed Matter](#); [General Physics](#); [Many-Body Physics](#) ... [Show all topics](#)**Sponsored by** [DCOMP](#) [DAMOP](#) [DCMP](#) Saved Add Save Add< [Prev](#)[Next](#) >**PRESENTATIONS** (13)

Charge Transport in Interacting Electron–Phonon Models. Insights Offered by Hierarchical Equations of Motion

5:36 pm – 5:48 pm

Presenter: Veljko Jankovic (Institute of Physics Belgrade, University of Belgrade)

Authors: Petar Mitrić (Institute of Physics Belgrade, University of Belgrade), Darko Tanasković (Institute of Physics Belgrade, University of Belgrade), Nenad Vukmirović (Institute of Physics Belgrade, University of Belgrade)

Phonon-limited charge mobility is determined by the finite-temperature real-time current autocorrelation function, whose computations often rely on approximations of unknown domain of validity.

We describe how the hierarchical equations of motion (HEOM) method yields numerically exact charge mobility in one-dimensional electron–phonon models with discrete undamped phonon modes [1]. Our results are representative of the long-chain limit and fully capture the crossover from ballistic to diffusive charge dynamics. This is made possible by formulating the HEOM in momentum space and stabilizing them by an appropriate closing scheme.

Filter presentations



3:00 pm – 3:36 pm

Quantum Geometric Superconductivity: Non-equilibrium and Finite Temperature

Paivi Torma (presenter)

3:36 pm – 3:48 pm

Controlled description of fractional quantum Hall physics by Feynman’s diagrammatic expansion.

Ben Currie (presenter), Evgeny Kozik

3:48 pm – 4:00 pm

Optical signatures of dynamical excitonic condensates

Andrew J Millis (presenter), Alexander Osterkorn, Yuta Murukami, Tatsuya Kaneko, Zhiyuan Sun, Denis Golez

4:00 pm – 4:12 pm

Effects of phonon dispersion on the bond-bipolaron superconductivity

Chao Zhang (presenter), Nikolay Prokof’ev, Boris Svistunov

4:12 pm – 4:24 pm

Feynman diagrammatics based on discrete pole representations: A path to renormalized perturbation theories

James P.F. LeBlanc (presenter)

Considering the diagonal dynamic disorder (the Holstein model) at moderate adiabaticity ratios, we find that vertex corrections do not significantly change the mobility predicted by the dynamical mean-field theory, yet significantly affect the details of the ballistic-to-diffusive crossover [2]. Considering the off-diagonal dynamic disorder (the Peierls model), which influences charge transport in organic semiconductors, we devise a proper treatment of the phonon-assisted current, and analyze the relative importance of band and phonon-assisted contributions to mobility.

4:24 pm – 4:36 pm

Controlled analytic continuation of Matsubara correlation functions using minimal pole

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