Friday, 08.12.2023, 1:15 p.m.
in Lecture Hall I of the Physics Institute

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„Mixing, stopping, coupling, lifting, and other keys to the second Monte Carlo revolution"

The Monte Carlo method is at the origin of the revolution in physics that has brought the electronic computer into our research laboratories and class rooms. Since its beginning, in 1953, the method has relied on the detailed-balance condition to map general computational problems onto equilibrium-statistical-physics systems. Such reversible Markov chains are generally characterized by diffusive transport. In the last two decades, a second revolution has taken place, where the detailed balance is broken and thus, also, the analogy with equilibrium statistical physics. The steady state of non-reversible Markov chains agrees with that of the equilibrium approach, but it is often approached ballistically, rather than diffusively.

In this talk, I will introduce to this interdisciplinary field of research about non-equilibrium in equilibrium, starting with the keywords of modern Markov-chain Monte Carlo. In particular, I will discuss applications from Bethe-ansatz solvable particle models to new Monte Carlo algorithms in statistical and chemical physics.
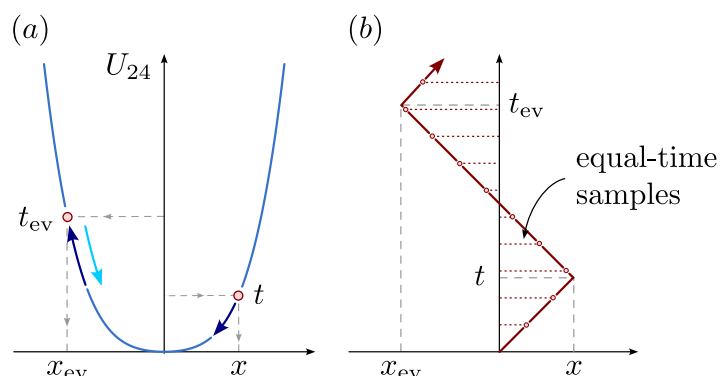
Everybody is welcome, especially students of all semester.
Coffee and tea will be available after the colloquium.