Quantum Brownian Motion: Facts, debatable issues and unsolved issues

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The talk will provide an introduction to the theoretical schemes (methods and tools) to describe the features of *quantum Brownian motion* (which rule phenomena such as rate theory, stochastic resonance, etc.) which occur at extreme low temperatures, up to the transition towards higher temperatures where quantum correlations start to fade out and a classical behavior sets in. Special focus on is also paid to the regimes of validity of various those theoretical tools, together with various pitfalls and subtleties that arise in describing correctly of those arising quantum features.

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