Nonequilibrium dynamics of quantum glassy systems

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In this lecture I shall discuss some tools used to study the dynamics of a quantum disordered system in contact with an equilibrated quantum environment. I shall concentrate on

- the (Feynman-Vernon) description of a quantum thermal bath and dissipation;
- the imaginary-time (Matsubara) approach to the statistical properties of a quantum system in equilibrium;
- the close-time path (Schwinger-Keldysh) formalism for the real-time d ynamics of quantum systems;

and I shall discuss possible connections between the last two approaches.

Finally, I shall briefly discuss the behaviour of a quantum glassy system that stems from the application of these methods to a test model.

This lecture has connections with those of A. Bray and J. Kurchan. Two references are

U. Weiss, Quantum dissipative systems World Scientific 1999.
L. F. Cugliandolo and G. Lozano, Phys. Rev. **B59**, 915 (1999).