Quantum stochastic semigroups/cocycles/evolutions in discrete and continuous time

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In the first part of this talk I shall describe the structure of discrete-time and continuous-time quantum stochastic cocycles and the appropriate scaling for the convergence of the former to the latter, in the form of a Donsker-type invariance principle (functional central limit theorem). This will be illustrated by the repeated interactions model of Attal and Pautrat.

In the second part I plan to show how quasifree-driven QS cocycles arise naturally as limits of QRW's in the above model. In particular we shall see
how the covariance of a quasifree Brownian motion emerges from the data of a faithful normal state on an underlying particle algebra.

Based on joint work with Alex Belton and Michal Gnacik, with Ollie Margetts, and with Ping Zhong.