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NITheCS and the Department of Physics at Stellenbosch University jointly present a

COLLOQUIUM:

Open Quantum Systems

Prof Marco Merkli (Memorial University of Newfoundland, Canada)

Friday, 24 March 2023 | 12h00 – 13h00 SAST

Attend in person* or online

**** Tea Room, Physics Department, Stellenbosch University***

ABSTRACT

Systems which exchange energy, matter, or merely information with their surroundings are called open. Usually, those surroundings are much `bigger' than the system itself and influence its dynamics significantly. Decoherence, sudden death of entanglement, and thermalization are typical consequences. In this talk, we will review some concepts and phenomena of the theory of open quantum systems. In particular, we will discuss their evolution equations, which are derived from the Schrödinger equation for the complex consisting of the system plus its surroundings. We will discuss the Born- and Markov approximations which lead to the ubiquitous master equation governing the open system dynamics. We will present some ideas behind recent theoretical methods allowing to show the validity of the master equation with precision. The talk will not be overly technical and it will be accessible to physicists which are not specialists in this topic.

BIOGRAPHY

Marco Merkli is a faculty member of the Department of Mathematics and Statistics of Memorial University in St. John's Canada. He is a mathematical physicist whose research centres around the description of the dynamics of open quantum systems. He is trying to bring together the mathematical and physical communities interested in quantum sciences.

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