

## Mini-School

### Introduction to open quantum systems

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**Abstract:** In these lectures, we will introduce the theory of open quantum systems, beginning from the statistical foundations of quantum mechanics and progressing to the formulation of the dynamics of open systems in terms of quantum master equations. We will then proceed to discuss the dynamical map, with particular attention paid to the theory of dynamical semi-groups which introduces the notion of a quantum Markov process. In turn, this will provide us with an intuition for understanding quantum non-Markovianity according to the divisibility of the dynamical map. A number of recently proposed methods to treat the dynamics of non-Markovian open quantum systems will also be discussed.

**Lecture 1:** 03 November 2020

**Lecture 2:** 10 November 2020

**Lecture 3:** 17 November 2020

**Lecture 4:** 24 November 2020

**Time: 14h00 -15h00**



**Short Bio:** Graeme is currently a postdoctoral researcher in the Quantum Research Group at the University of KwaZulu-Natal. He holds an MSci degree in Theoretical Physics from University of Birmingham (UK), and received his PhD from the University of Sussex (UK) in 2018. His research mainly focuses on the theoretical study of open quantum systems with particular emphasis on the development of exact approaches for analyzing non-Markovian quantum dynamics.

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