

School of Physical Sciences Seminar

Title: A short tour of quantum speed limits

When: Thursday 11 Feb 2021 at 1pm via Zoom

Speaker: Dr Steve Campbell from UCD

Abstract: Uncertainty lies at the very heart of quantum mechanics. This notion is mathematically captured by the famous indeterminacy principles laid out by Heisenberg in 1927. One does not need to be a physics student to have come across the position-momentum uncertainty principle, while less well known is the energy-time (E-T) formulation. A remarkable outcome from the E-T uncertainty principle is the quantum speed limit, which uses the basic tenets of quantum mechanics to bound the minimal time a quantum system needs to evolve between two distinct states. In the last decades the study of the quantum speed limit has enjoyed a renewed interest, partially driven by the rapid development of quantum technologies and quantum thermodynamic devices, where a minimal time sets the ultimate bounds on efficiency. This seminar will start reviewing the history and development of the QSL and discuss recent applications to many-body systems and their extension to open quantum systems.