THEORY LECTURE: Quantum Thermodynamics

MARTI PERARNAU-LLOBET

February 22, 2022 to March 03, 2022
10:00 to 12:00
BLR & Online (Zoom)

Abstract:
In this series of lectures I will give an introduction to the growing field of Quantum Thermodynamics. I will first explain why Gibbs or thermal states play a central role in the theory, and present a derivation of the second law of thermodynamics starting from minimal assumptions on the underlying quantum dynamics. I will then discuss several applications such as Landauer's erasure, quantum battery charging, and quantum heat engines. Next, I will move beyond average laws and present several recent results to describe thermodynamic fluctuations, including quantum fluctuation theorems and quantum fluctuation-dissipation relation for work. Finally, I will discuss physical implementations of these theoretical ideas in solid state devices. If time allows, I will also introduce the basics of quantum thermometry.

About the speaker
Biography:
Marti Perarnau-Llobet is a researcher at GAP, University of Geneva, since May 2020. Previously, he was postdoc at the Max Planck Institute for Quantum Optics in Garching (2016-2020) in the Theory group of Ignacio Cirac, and did the Phd in ICFO (2012-2016) in Acin's group. His research activity mainly focuses on quantum thermodynamics (optimisation of finite-time protocols, quantum signatures in thermodynamics, thermometry, connections with many-body physics), but he also works on some aspects of quantum information and optics (e.g. quantum metrology and superradiance).
Theory Lectures: 22, 24, February 1, 3 March 2022.
10h - 12h, BLR and Online (Zoom)?
After registering, you will receive a confirmation email containing information about joining the online meeting.
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