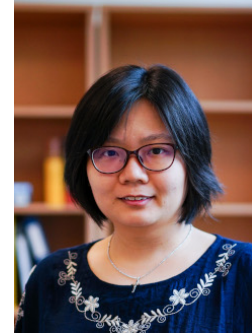




Quantum Field Thermal Machines

Asst Prof Nelly Ng Huei Ying
School of Physical and Mathematical Sciences

Date: 22 October 2021 (Friday)
Time: 4.30pm - 5.30pm
Venue: Zoom
Meeting ID: 970 2545 9421
Passcode: 570129



Abstract

Recent years have enjoyed an overwhelming interest in quantum thermodynamics, a field of research aimed at understanding thermodynamic tasks performed in the quantum regime. In this talk, I introduce a proposal on how to realize a thermal machine in where the working fluids of the machine are quantum fields. We identify several building blocks of the machine, and study them numerically with the Tomonaga-Luttinger liquid model. By concatenating these building blocks, we design a complete thermodynamic cycle that cools the quantum gas. The building of such a machine, and its operation in parameter regimes where quantum effects become significant, will allow for the exploration of open questions in quantum thermodynamics, in particular the interplay of quantum information and energy in complex many-body quantum systems. During the talk, I will also share about my academic trajectory starting out as an undergrad student here at PAP SPMS.

Biography

Nelly received her B.Sc. (Hons) from the physics department of SPMS, NTU in 2012. She then worked as a research assistant at the Centre for Quantum Technologies for a few years. In 2017, she received her PhD on the study of quantum information theory and thermodynamics from Delft University of Technology. Nelly was hosted between 2017-2020 at the Free University of Berlin, first as an Alexander von Humboldt Research Fellow, and then subsequently employed as a postdoctoral fellow. She joined the Physics faculty at SPMS, NTU in November 2020 as an assistant professor. Her research interests consist of further developing the tools of quantum information in the context of probing problems in many-body physics.

Stay in touch!  

spmsodysseycomm@e.ntu.edu.sg



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