NITheP Colloquium

Monday, 09 November 2020, 16h00

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An introduction to Quantum Thermodynamics

Abstract: The aim of this talk is to give a brief overview of some recent achievements of the fast-growing field of Quantum Thermodynamics. The focus will be more on intuitive and physical explanations rather than technical details. After introducing and recalling some of the main achievements of Thermodynamics, we provide compelling reasons for starting the exploration of Thermodynamics at the nanoscale and in the quantum regime. We will see that such perspective gives rise to several fundamental questions involving core concepts of Physics and Quantum Mechanics like energy, information, fluctuations, quantum coherences, and quantum correlations. Most of these questions are still active subjects of research, but partial answers will be provided. Finally, as application, we will bring forward the very debated question of quantum advantages in ``thermodynamic tasks'', including energy production (work), refrigeration, thermometry, generation of quantum resources, and timekeeping. We conclude with some perspectives related to information processing and quantum/classical computation.

Bio: Dr Camille Lombard Latune, after starting a Bachelor in Mathematics in southern France in 2004, He concluded a Bachelor and later a Master in Physics in Paris (ENS/Université Paris VI and XI). He then moved to Brazil and continued with a PhD in the group of Prof. Luiz Davidovich of Quantum Optics and Quantum Information of the Federal University of Rio de Janeiro (UFRJ). After concluding the PhD, he started a post-doc in 2015 in the Group of Quantum Research leaded by Prof. Francesco Petruccione at University of KwaZulu-Natal (UKZN), Durban, SA, until today.

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