



Mathematics and CS Seminar

Gradient estimates for quantum Markov semigroups and return to equilibrium

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(Quantum) Markov semigroups play a role in a variety of fields such as operator algebras, classical and quantum probability, differential geometry and open quantum systems. As they model dissipative time evolutions, they tend to converge to an equilibrium state in the long-time limit. One central question is to quantify this return to equilibrium. If one uses the entropy as a measure of the deviation from the equilibrium state, this question is closely related to logarithmic Sobolev inequalities. In the classical case, Bakry-Émery theory or optimal transport methods allow to deduce such logarithmic Sobolev inequalities from lower bounds on the Ricci curvature. In this talk I will review a notion of lower Ricci curvature bounds via a gradient estimate that allows to transfer the optimal transport approach to the quantum setting. I will discuss some of its stability properties and show how to obtain lower Ricci curvature bounds for a couple of examples such as quantum tori, free group factors and q-Gaussian algebras. (This talk is based on joint work with Haonan Zhang.)

Thursday, November 5, 2020 04:15pm - 05:15pm

Online via Zoom



This invitation is valid as a ticket for the ISTA Shuttle from and to Heiligenstadt Station. Please find a schedule of the ISTA Shuttle on our webpage: <https://ista.ac.at/en/campus/how-to-get-here/> The ISTA Shuttle bus is marked ISTA Shuttle (#142) and has the Institute Logo printed on the side.