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Mathematical Colloquia

Monday, 28 October 2019

17:15 h, Lecture Room 119

Prof. Dr. Jan Maas, Institute of Science and Technology Austria

Gradient flows and optimal transport: continuous, discrete, and quantum

Abstract:

At the end of the 1990s it was discovered by Jordan/Kinderlehrer/Otto that the diffusion equation can be formulated as a gradient flow in the space of probability measures, where the driving functional is the Boltzmann-Shannon entropy, and the dissipation mechanism is given by an optimal transport metric. This result has been the starting point for striking developments at the interface of analysis, probability theory, and geometry.

In this talk I will review work from recent years, in which we introduced new optimal transport metrics that yield gradient flow descriptions for discrete stochastic dynamics and dissipative quantum systems. This allows us to develop a discrete notion of Ricci curvature, and to obtain sharp rates of convergence to equilibrium in several examples. The talk is based on joint works with Matthias Erbar and with Eric Carlen.