IST AUSTRIA
Institute of Science and Technology

Mathematics and CS Seminar

Carlen-Frank-Lieb conjecture and monotonicity of *α-z* Rényi relative entropy

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Host: Jan Maas

In this talk I will confirm a conjecture of Carlen, Frank and Lieb, which concerns the joint convexity of the trace function

$$\Psi_{p,q,s}(A,B) = \mathrm{Tr}(B^{\frac{q}{2}}K^*A^pKB^{\frac{q}{2}})^s,$$

where $-1 \leq q < 0, 1 \leq p \leq 2, (p,q) \neq (1,-1), s \geq \frac{1}{p+q}$, A and *B* are positive semi-definite matrices and *K* is a fixed matrix. This also confirms the Audenaert-Datta conjecture with $s = \frac{1}{p+q}$ as a special case. Together with other known results, this will give full range of (p,q,s) for $\Psi_{p,q,s}$ to be jointly convex/concave. As a consequence, we obtain the full range of (α,z) for *α-z* Rényi relative entropies to be monotone under completely positive trace preserving maps. We will also use the same method to give simple proofs for some known results on joint convexity/concavity of $\Psi_{p,q,s}$.

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Thursday, March 7, 2019 5.00pm

IST Austria Campus Big Seminar room Ground floor / Office Bldg. West (I21.EG.101)

This invitation is valid as a ticket for the IST Shuttle from and to Heiligenstadt Station. Please find a schedule of the IST Shuttle on our webpage (note that the IST Shuttle times are highlighted in dark green):
http://ist.ac.at/fileadmin/user_upload/pdfs/IST_shuttle_bus.pdf
The IST Shuttle bus is marked IST Shuttle and has the Institute Logo printed on the side.