

Meetings of the Belgian Quantum Physics Initiative

Colloquium



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The body of quantum correlations in the minimal scenario

The study of the convex body of quantum correlations has been an important theme of Quantum Information Theory from the beginning. In this talk I will visualize and describe this body in the minimal setting: two parties, two settings per party, two outcomes per measurement, and zero marginals. The correlation body, and its classical and no-signalling counterparts then live in 4 dimensions. I will cover all aspects I could think of, including some apparently new statements such as the self-duality of the quantum correlation body. I will sketch the methods used to derive such results, and how they generalize to more complex instances. One key tool is the universal C^* -algebra generated by two projections, which directly cuts down the problem from infinite Hilbert space dimension to 4 (or 2^N in the problem with N parties). The outer approximations furnished by semidefinite hierarchies are tight in the minimal case, but only in this case. Strong self-testing statements are available, and semialgebraic convexity theory gives further insights.

Thursday 9th DECEMBER 2021 AT 2.30 P.M.

Two short talks will follow:

4:00pm: Timour Ichmoukhamedov (Antwerp)

« Path integral treatment of bosons interacting through general memory kernels »

4:30pm: Anton Potocnik (IMEC)

« Building scalable superconducting quantum processors »