

# Interactions between Operator Space Theory and Quantum Probability with Applications to Quantum Information

Operator space theory is the joining element of this proposal. The theory of operator spaces is a quantisation of the theory of Banach spaces. In our project we want to study its interactions with operator algebras and other areas of functional analysis, classical and quantum probability, noncommutative harmonic analysis, and quantum information theory. The main topics of the workshop will be the following.

- a) Exploration of operator spaces by quantum probabilistic methods; Grothendieck's program for operator spaces; multipliers and applications.
- b) Analytic theory of quantum stochastic integration; Markov dilations and deformations of quantum groups or Fock spaces.
- c) Applications of operator spaces and quantum probability to quantum information; Bell inequalities and entanglement.
- d) Harmonic analysis on locally compact quantum groups; operator algebras and operator spaces associated to quantum groups
- e) Interplay between the four topics