Produits tensoriels de C^*-algèbres

par
Gilles Pisier
Inst. Math. Jussieu (UPMC)
et
Texas A&M University
College Station, TX 77843, U. S. A.

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Abstract

The talk will be partly expository. We will present the state of the art concerning tensor products of C^*-algebras after the remarkable advances due to Kirchberg. We will describe the properties WEP (weak expectation property) and LLP (local lifting property) that he conjectured to be equivalent in his 1993 Inventiones paper, and the progress made since then. His conjecture that LLP $\Rightarrow$ WEP remains open and is equivalent to a major problem raised by Alain Connes. We will describe recent joint work with N. Ozawa, showing that for any pair M, N of von Neumann algebras such that the algebraic tensor product $M \otimes N$ admits more than one C*-norm, the cardinal of the set of C*-norms is at least $2^{\aleph_0}$. The talk will also recall the connection of such questions with the non-separability of the set of finite dimensional (actually even of 3-dimensional) operator spaces which goes back to a 1995 GAFA paper with Marius Junge, and several recent "quantitative" refinements obtained using an estimate of the metric entropy of the set of quantum expanders.