

A report of Man-Duen Choi choi@toronto.edu (2pages)

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I was delighted to participate at the Second Conference of Tsinghua Sanya International Mathematics Forum (TSIMF) at Howard Johnson Hotel in Sanya, Dec 19-22, 2011. I had presented a 40-th address on Dec 21, 2011 in the Session of Applied mathematics.

Title: The Taming of the Shrew with Completely Positive Linear Maps

Abstract:

I look into the full structure of positive linear maps between matrix algebras. In particular, I wish to tame the quantum entanglements, from the pure mathematical point of view. Note that the research work along these lines, have been proven to be useful to the foundation of quantum information in the light of (the reality of) quantum computers.

This is an expository talk in matrix theory; no knowledge of quantum information is assumed.

Additional Notes:

- I am a pure mathematician and I am surprised that most of my earliest research work (of 70's) has been used intensively in the recent development of quantum information theory. In particular, my paper "Completely positive linear maps on complex matrices", (Linear Algebra Appl. 10 (1975), pp. 285-290) has become the pioneering research work in the field. It has been cited in more than 600 research papers (as shown in Google Scholars 2011 November).
- My recent new task has been travelling in the world to tell everybody .
 - Check whether physical axioms fit in my mathematical model
 - Tell EVERYBODY (including persons who don't know / like physics) the down-to-earth structure of quantum computers.
 - Need to *sell* the notion of Non-commutative Probability and Non-commutative Geometry of very low dimensional case.

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