Joint CQSE and CASTS Seminar

Weekly Seminar
Mar. 8, 2013 (Friday)

TIME	Mar. 8, 14:30 ~ 15:30
TITLE	Duality of Quantum Entanglement and Positive Maps
SPEAKER	Prof. Zheng-Yao Su
	National Center for High Performance Computing
PLACE	Rm716, CCMS & New Physics Building, NTU

Abstract

As a characteristic trait of the quantum realm, entanglement plays an essential role in almost every scenario of quantum information processing. A positive map preserves the positivity of each density operator within a Hilbert space during the mapping and thus is a fundamental issue in the study of quantum dynamics, although this inquiry was mathematically motivated by the Hilbert's 17th Problem in early years. In this talk, I will portray a Duality Picture to relate these two subjects and prove the equivalences of basic concerns on the both sides. Importantly, from this Picture, algorithms will be derived to, necessarily and sufficiently, determine the entanglement of a density operator and the positivity of a linear map respectively with complexity polynomially bounded by the system dimension.