

CQSE-NCTS-CASTS-CTP

Joint Seminar

「May 7, 2021 (Friday)」

- Time : 14:30~15:30
- Place : Rm104, New Physics Building
- Speaker: **Prof. Yeong-Cherng Liang** 梁永成
Dept. of Physics, NCKU
國立成功大學物理學系
- Title : **Activating hidden teleportation power:
theory and experiment**

▲ The seminar is also open to non-NTU members; hence all participants must wear a mask. (Following Fall and Winter Precautionary Measures)

**Sponsored by Center for Quantum Science and Engineering (CQSE), National Center for Theoretical Sciences (NCTS)-Physics Division- Themetical Group TG1.1, Center for Advanced Study in Theoretical Sciences (CASTS), and Center for Theoretical Sciences (CTP), NTU

Joint CQSE-NCTS-CASTS-CTP Seminar

2021

May 7, Friday

TIME May 7, 2021, 2:30~3:30pm
TITLE Activating hidden teleportation power: theory and experiment
SPEAKER Prof. Yeong-Cherng Liang
Department of Physics, National Cheng Kung University
PLACE Rm104, Chin-Pao Yang Lecture Hall,
CCMS & New Physics Building, NTU

Abstract:

Ideal quantum teleportation transfers an unknown quantum state intact from one party Alice to the other Bob via the use of a maximally entangled state and the communication of classical information. If Alice and Bob do not share entanglement, the maximal average fidelity between the state to be teleported and the state received, according to a classical measure-and-prepare scheme, is upper bounded by a function f_c that is inversely proportional to the Hilbert space dimension. In fact, even if they share entanglement, the so-called teleportation fidelity may still be less than the classical threshold f_c . For two-qubit entangled states, conditioned on successful local filtering, the teleportation fidelity can always be activated, i.e., boosted beyond f_c . In this talk, for all dimensions larger than two, we show that the teleportation power hidden in a subset of entangled two-qudit Werner states can also be activated. In addition, we show that an entire family of two-qudit rank-deficient states violates the reduction criterion of separability, and thus their teleportation power is either above the classical threshold or can be activated. Using hybrid entanglement prepared in photon pairs, we also provide the first proof-of-principle experimental demonstration of the activation of teleportation power hidden in this latter family of qubit states.

Biography Brief:



Yeong-Cherng Liang completed his B.S.c, B.S.c (Hons, 1st), and M.S.c in Physics from National University of Singapore in Jun. 1999, Dec. 1999, and Oct. 2002, respectively. Then, he completed his Ph.D. in University of Queensland, Australia in 2007. He was the Maître Assistant in Department of Applied Physics, University of Geneva, Switzerland during 2012 – 2013 and was the Postdoc in Institute for Theoretical Physics, ETH Zürich, Switzerland, during 2013 – 2015. In 2020 he was awarded an Academia Sinica Research

Award for Junior Research Investigators and an Institute of Physics Trusted Reviewer Award.

His research interests include Quantum Nonlocality, Quantum Foundations and Quantum Information Theory.

- N O T I C E -

- ▲ Please swipe NTU card / ID card when entering CCMS-Phys. Building.
- ▲ Both faculty members and participants are required to wear sanitary masks all the time.
- ▲ All participants and event workers should stay at designated areas and minimize contact at short distances.
- ▲ We collect personal info during covid-19 only for contact tracing purposes.

