CQSE-NCTS-CASTS-CTP

Joint Seminar

「Apr. 23, 2021 (Friday)」

- Time : 14:30~15:30
- Place : Rm104, New Physics Building
- Speaker: Dr. Ying-Cheng Chen 陳應誠

  IAMS, Academia Sinica

  中央研究院原子與分子科學研究所
- Title : Quantum Computing and Simulation with Rydberg-interacting Neutral Atoms

▲The seminar is also open to non-NTU members; hence all participents 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
April 23, Friday

TIME Apr. 23, 2021, 2:30~3:30pm
TITLE Quantum Computing and Simulation with Rydberg-interacting Neutral Atoms
SPEAKER Dr. Ying-Cheng Chen
Institute of Atomic and Molecular Sciences, Academia Sinica
PLACE Rm104, Chin-Pao Yang Lecture Hall,
CCMS & New Physics Building, NTU

Abstract:

Quantum computing is attracting significant attention due to its potential for solving classically intractable problems. However, its realization is notoriously difficult due to the requirement on accurate control of the strong interactions between large-scale qubits while maintaining weak coupling to the environment. Current leading platforms include the superconducting qubits and trapped ions, with achieved qubits number around 50 and average fidelity of two-qubit gates around 99%. To enable useful applications, significant improvements on these figure of merits are required. Recently, individual atoms trapped in optical tweezer arrays have emerged as one of the versatile platforms for quantum computing and simulation. Defect-free qubit numbers of a few hundreds have been routinely generated. Two qubit gates are implemented by coherent driving to highly excited Rydberg states, which exhibit strong and long-range interactions and a fidelity of around 98% has been achieved recently. While large-scale gate-based quantum circuits still wait to be demonstrated, this platform has been used to simulate quantum spin models in regimes beyond those accessible via numerical studies with modern supercomputer. In this talk, I will introduce the status and our future plan for the research along this direction.

Biography Brief:

Ying-Cheng Chen received his B.S., M.S, and Ph.D. in Physics from National Tsing-Hua University in 1993, 1995, and 2002, respectively. He was the adjunct assistant professor in NTHU during 2007 – 2014 and was the postdoctoral research fellow in Rice University, Houston, USA, under the supervision of Prof. Thomas C. Killian (2003 – 2004) and Prof. Randall G. Hulet (2002 – 2003). He is currently the associate research fellow at IAMS, Academia Sincia.

There are two main directions in his current research; one is to generate ultracold molecules and study their many-body interactions and the other is to utilize ultracold atomic samples to study the low-light-level nonlinear optics and their applications in quantum information science.

- 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.