Joint CQSE & NCTS Online Seminar

2021
Oct. 1, Friday

TIME	Oct. 1, 2021, 2:30~3:30pm
TITLE	Introduction to Quantum Computing hardware in solid state systems
SPEAKER	Prof. Kuei-Lin Chiu Dept. of Physics, National Sun Yat-sen University
LINK	https://meet.google.com/odw-oosb-jpw

Abstract:

Quantum computing (QC) has become a popular research field worldwide. At present, major QC hardware systems can be classified into superconducting qubits, quantum dots, trapped ions, photons, topological qubits – all are researched by teams all over the world. In this talk, I will briefly introduce the operation principles of QC hardware in solid state systems (i.e., superconducting qubits, quantum dots and topological qubits). After this brief overview, I will talk about an emerging field in superconducting qubit which involves Integrating semiconductor/2D materials with superconducting circuits. In particular, topological materials, for their topologically protected surface and edge states which can serve as a robust channel to carry supercurrent, are also promising candidates for use in 2D materials-based quantum computing devices. I will review this field and talk about some recent developments including our own works.

Biography Brief:

Kuei-Lin Chiu is currently an assistant professor in the Department of Physics, National Sun Yat-sen University, Taiwan. He also serves as a consultant in Quantum Computing Research Center in Hon Hai (Foxconn) Research Institute since 2021. Prior to this, he was an associate research fellow (faculty) in the Key laboratory of Quantum information, University of Science and Technology of China (USTC) and a post-doc at the Department of Physics at MIT (2015-2017). He obtained his PhD from the Cavendish Laboratory in Cambridge University where he worked on quantum transport in 2D material-based quantum dots involving using microwave to control single electrons. His current research focuses on topological materials and superconducting quantum circuits. In particular, he demonstrated a flux-tunable superconducting quantum circuit consisting of Weyl semimetal MoTe2, with an intention to probe the topological properties of materials using superconducting qubit measurement techniques. This research is highlighted in the University news of NSYSU (https://news.nsysu.edu.tw/p/406-1120-249261,r3979.php?Lang=zh-tw&fbclid=IwAR09pSyC-flYOvboYUHYidEqGgN5MaMnTjPEAisnLVcxBmjy7YcyA1ZDIIU).