**Quantum Speed Limits and Fidelity Bounds: From Driven Many-Body Systems to Adiabatic Quantum Computing**

Jyong-Hao Chen

Dept. of Physics, NCU

Understanding the fundamental limits of quantum evolution is crucial in the rapidly evolving field of quantum information science. Quantum speed limits (QSLs) provide these fundamental bounds, dictating the minimum time required for a quantum system to evolve between two states. In this talk, I will delve into the concept of QSLs, exploring their theoretical foundations and practical implications. Specifically, I will discuss recent advancements in applying QSLs to quantum many-body systems and adiabatic quantum computing, offering new tools for estimating quantum fidelity and runtime.