

Quantum sensing assisted by near-term quantum algorithms (25+5)

Wednesday, January 15, 2025 9:00 AM (30 minutes)

In this presentation, we explore near-term quantum algorithms designed to prepare optimal quantum states for applications in quantum sensing and metrology. These algorithms can be tailored for implementation on noisy intermediate-scale quantum (NISQ) devices. Specifically, we examine the variational quantum algorithms to estimate the quantum Fisher information for this task and highlight their potential applications in atomic, molecular, and optical (AMO) physics, as well as nuclear physics. This talk is based on the following works:

- [1] Jacob L. Beckey, M. Cerezo, Akira Sone, and Patrick J. Coles, *Phys. Rev. Research* 4, 013083 (2022)
- [2] M. Cerezo, Akira Sone, Jacob L. Beckey, and Patrick J. Coles, *Quantum Sci. Technol.* 6, 035008 (2021)
- [3] Akira Sone, M. Cerezo, Jacob L. Beckey, and Patrick J. Coles, *Phys. Rev. A* 104, 062602 (2021)

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