Canadian Association
of Physicists

Association canadienne
des physiciens et physiciennes

Contribution ID: **3632**   Type: **Invited Speaker / Conférencier(ère) invité(e)**

(I) Neural quantum state tomography, improvements and applications

Tuesday 20 June 2023 15:45 (30 minutes)

Viewing neural quantum state tomography (NQST) as a flexible method for capturing classical snapshots of experimentally prepared quantum states opens doors to many applications of it in quantum simulation. In this talk we first review "Neural Error Mitigation" (Nat Mach Intell 4, 2022) for improving predictions of various observables obtained via quantum simulation of quantum states of interest in quantum chemistry and quantum electrodynamics. We then show that incorporating classical shadow tomography in NQST significantly improves its learning of complex quantum states, and numerically demonstrate this advantage through case studies in atomic and condensed-matter physics.

Keyword-1

Quantum state tomography

Keyword-2

Machine Learning

Keyword-3

Author: RONAGH, Pooya

Presenter: RONAGH, Pooya

Session Classification: (DCMMP) T4-7 Quantum Materials Symposium | Symposium sur les matériaux quantiques (DPMCM)

Track Classification: Symposia Day (Tues. June 20) / Journée de symposiums (mardi, le 20 juin): Symposia Day (DCMMP - DPMCM) - Quantum Materials | Matériaux quantiques