

OpenQMBP2023: New perspectives in the out-of-equilibrium dynamics of open many-body quantum systems



Contribution ID: 40

Type: **not specified**

Neural-Network Quantum States for Entanglement Phase Transitions

Tuesday, June 13, 2023 11:00 AM (20 minutes)

The success of Machine Learning owes to the development of neural-networks, variational approximators that can efficiently represent unknown functions living in high-dimensional spaces. Recently, those techniques have been ported to the field of numerical physics and used to approximate inherently high dimensional objects such as the Many-Body Wave-Function [1] or Density-Matrix [2] in an approach generally known as Neural-Network Quantum States (See Ref.3 for a general introduction).

In this seminar I will first discuss why established approaches in NQS literature are incompatible with the simulation of the dynamics undergoing strong measurements, and then I will present a new approach that allowed us to avoid previous limitations [4].

Finally, I will showcase some recent results on the entanglement dynamics of large 2-Dimensional, non integrable systems.

—

[1] Carleo and Troyer, *Science* 355, 602 (2017)

[2] F Vicentini, A Biella, N Regnault, C Ciuti, *Phys. Rev. Lett* 122 (25), 250503

[3] A. Dawid et Al, *arXiv:2204.04198* (2022)

[4] A. Sinibaldi, C. Giuliani, G. Carleo, F. Vicentini, *arXiv: 2305.14294* (2023)

Presenter: VICENTINI, Filippo (Ecole Polytechnique)

Session Classification: Conference: Dissipative Many-Body Quantum Systems