Tuesday, September 8th

At 3:45pm

Zoom Mtg

Zoom
link: https://tamu.zoom.us/j/98267978023?pwd=YmJFYmd3VjFVTURoL3YxYXFjaFNldz09
Zoom password: Lovato20
Time: 9/8/20 at 3:45pm

Title: An overview of nuclear quantum Monte Carlo

Abstract:

The last decades have witnessed tremendous progress in nuclear many-body theory, aiming to understand how nuclei self-emerge from the individual interactions among protons and neutrons. Effective field theories exploit the symmetries of quantum chromo-dynamics to construct realistic nuclear potentials and consistent electroweak currents systematically. They are the input to “ab-initio” many-body methods that solve the many-body Schrödinger equation with controlled approximations. Among them, quantum Monte Carlo approaches are known for their accuracy and capability to treat on the same footing long-range structure and short-range dynamics. I will report on recent quantum Monte Carlo progresses towards a comprehensive description of the spectrum of light nuclei, their interactions with neutrinos, and the nucleonic matter equation of state. A novel representation of the nuclear many-body wave function in terms of artificial neural networks, suitable to extend the reach of quantum Monte Carlo to medium-mass nuclei, will also be discussed.

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