



# **Neural-network quantum states for infinite matter**

**Jane Kim**

Facility for Rare Isotope Beams  
Michigan State University

Deep neural networks (DNNs) have demonstrated tremendous promise in solving quantum many-body problems. In this work, we leverage the flexibility and generality of DNNs to model the ground state wave functions of dilute neutron star matter and the unitary Fermi gas. We discuss the reinforcement learning scheme and how the symmetries of the system are constrained in the ansatz. This method easily surpasses standard variational Monte Carlo, and is competitive with state-of-the-art diffusion Monte Carlo at a fraction of the computational cost.

**Thursday, March 2nd, 2023**

**4:00 pm**

**Lindley Hall room S321**