

INDIAN ASSOCIATION FOR THE CULTIVATION OF SCIENCE

2A & 2B, Raja S.C. Mullick Road, Jadavpur, Kolkata-700032, India

Seminar Notice

Org. by

School of Physical Sciences

Title:	Reinforcement Learning to Control Quantum Systems Away from Equilibrium
Speaker:	Marin Bukov, Department of Physics, University of California, USA
Date:	November 25, 2019 (Monday)
Time:	16:00 Hours
Venue:	Physics Seminar Room (C-406), 3rd Floor, Centenary Building, IACS
Abstract:	The ability to prepare a physical system in a desired quantum state is central to many areas of physics such as nuclear magnetic resonance, quantum simulators, and quantum computing. Yet, preparing states quickly and with high fidelity remains a formidable challenge. In this work I will show how a Reinforcement Learning agent succeeds in finding short, high-fidelity driving protocols from an initial to a target state in non-integrable many-body quantum systems of interacting qubits, and the periodically-driven quantum Kapitza oscillator. Reinforcement Learning (RL) agents "learn" about the underlying physical system solely through a single scalar reward (the fidelity of being in the target state) calculated from numerical simulations of the physical system. The study highlights the potential usefulness of RL for applications in the control of out-of-equilibrium quantum systems.

All are cordially invited to attend the seminar