Argonne
NATIONAL LABORATORY

PHY Seminar

Physics Division Seminar

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Flowing the Strong Interactions and the Electric Dipole Moment

Host: Ian Clöet

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Quantum Chromodynamics (QCD) is the local gauge theory describing strong interactions. It has been successfully adopted for calculations in the high-energy regime using perturbation theory. To understand the non-perturbative nature of QCD and related physical phenomena, a discretization of space-time is introduced, lattice QCD. In the past few years, a new theoretical method, the Gradient Flow, has turned out to be a powerful tool for non-perturbative studies of QCD. I will give a pedagogical introduction of the Gradient Flow and its use in the context of lattice QCD. Selected applications of the Gradient Flow, such as the calculation of the nucleon Electric Dipole Moment, will be discussed. I will clarify the importance of the Gradient Flow in renormalizing the CP-violating operators and discuss the difficulties and pitfalls that an EDM lattice QCD calculation entails.