



INVITATION

as part of the Mathematical Physics Theory Seminar

to the online talk by

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on

***“Conformally Symmetric Views from a Fuzzy Sphere:
Generalizing deconfined criticality to 3d N-flavor $SU(2)$
quantum chromodynamics”***

Abstract:

We present an innovative way to study quantum phase transitions on spherical geometry, using a fuzzy sphere regularization derived from the quantum hall effect. We have accurately calculated and analyzed the energy spectra at the (2+1)-d Ising transition, and explicitly demonstrated the state-operator correspondence (i.e., radial quantization), a fingerprint of conformal field theory. Since then we have computed many more quantities of interest to conformal field theory, such as the F-function, OPE coefficients, and observables for defect models. After reviewing the method and its applications generally, we specifically look at an application to an N-flavor candidate theory for QCD which exhibits a deconfined quantum critical point (DQCP), which is a mechanism for phase transitions beyond the Landau paradigm. The fuzzy sphere formalism offers a powerful lens to probe the model's critical behavior. Employing quantum Monte Carlo simulations of the generalized $Sp(N)$ -symmetric model, we probe the conformal window of the theories, with the fuzzy sphere formalism significantly reducing finite-size-effects.

Time: Tuesday, 2 December 2025, 2:00 p.m.

Location: Erwin-Schrödinger Lecture Hall, 1090 Vienna, Boltzmannngasse 5, 5th floor