Mathematical Physics
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I N V I T A T I O N

as part of the Mathematical Physics Theory Seminar

to the talk by

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(Tsing-Hua University Taiwan)

on

"A Matrix Model Proposal for Quantum Gravity and the Quantum Mechanics of Black Holes"

Abstract:
We propose a quantum mechanical theory of quantum spaces described by large N non-commutative geometry as a model for quantum gravity.The model admits fuzzy sphere as solution whose energy-radius relation precisely matches with that of the Schwarzschild black hole. Moreover the fuzzy sphere is endrosed with a Fermi sea of states arising from quantizing the fermions over the fuzzy sphere background. The counting of these microstates reproduces precisely the Bekerstein-Hawking entropy of black hole. We also show that the solution is stable against energy preserving perturbations, exactly like that of the Schwarzschild black hole in General Relativity. A more nontrival check is provided by the rotating fuzzy sphere solution, which we show to reproduce the energy, size, shape, angular momentum and entropy of the Kerr black hole in General Relativity. We will discuss how Newtonian gravity may be reproduced from the interaction of two fuzzy spheres in the large distance limit.
The talk is based on the following preprints:
2307.06164 [hep-th], 2406.01466 [hep-th], 2406.12704 [hep-th]

Time: Thursday, 10 July 2025, 1:15 p.m.

Location: Erwin-Schrödinger lecture hall, 1090 Vienna, Boltzmanngasse 5, 5th floor

sgd. S. Fredenhagen, M. Sperling