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A proposal for the theory of quantum gravity and quantum mechanics of black hole

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We propose a quantum mechanical theory of quantum spaces described by large N noncommutative geometry as a model for quantum gravity. The theory admits fuzzy sphere and fuzzy ellipsoid as solution. We show that these solutions reproduces precisely the horizon radius of a Schwarzschild black hole and a Kerr black hole. Moreover our quantum mechanical description gives rise to a set of microstates over these geometries, which reproduces precisely the Bekenstein-Hawking entropy of black hole. These results provide support that our proposed theory of quantum spaces is a plausible candidate for the theory of quantum gravity. Further progress and directions will be discussed.

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