Laboratory for Elementary Particle Physics (LEPP)

Theory Seminar

Edge Modes and Entanglement in Diffeomorphism-invariant Theories

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The Hilbert space of a theory with diffeomorphism symmetry does not factorize into spatial subregions due to gauge constraints. This presents a challenge for defining a notion of entanglement entropy associated with a subregion in these theories. In this talk, I will describe the extended phase space method of Donnelly and Freidel for handling this nonfactorization. It involves introducing edge modes living at the boundary of the subregion, whose purpose is to restore the diffeomorphism invariance that was broken by the subregion's presence. These edge modes are then expected to contribute to the subregion's entanglement entropy. I will further discuss the relevance of the edge mode entanglement to the entropy of black holes, where it may provide a statistical interpretation of the Wald entropy within the low energy effective description.

Special Day & Place

Tuesday November 14th, 2017

11:30am

438 Physical Sciences Building