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Laurent Freidel (Perimeter Institute): Corner symmetry and local holography: A paradigm for quantum geometry

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In this talk I will present an overview of the local holography program which provides a bottom-up perspective on quantum gravity design to understand the nature of quantum geometry from first principle. This new approach is deeply rooted in a renewed understanding of local symmetries in Gravity. It focuses first on the understanding of how gravitational systems decomposes into subsystems. It also provides a detailed description of the nature of entanglement of gravitational subsystems. I will emphasize the central role of the corner symmetry group attached to codimension 2 surfaces in capturing all the necessary data needed to glue back seamlessly quantum spacetime regions. I will present some elements of representation theory of these infinite dimensional corner symmetry groups for 4d gravity and show its connection with the symmetry algebra of perfect fluids. I will present recent results on the geometry and symmetry of null surfaces and the Quantization of Raychudhuri equations. If time permits I will mention some connections these results have with celestial holography and the higher spin asymptotic symmetry group.

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