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Universidad del País Vasco | Euskal Herriko Unibertsitatea

EHU Quantum Center

Theoretical Physics Seminar Series

Chern Simons inspired 2+1 Massive Gravity

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Abstract: In this work we propose a new 2+1 theory of gravity. We start with a modification of Chern-Simons 2+1 gravity by introducing a vector field to the usual composition of the vierbein and connection. We derive a new action that includes the Einstein-Hilbert term, a cosmological constant and a polynomial term for the vector field. After solving for the polynomial function, the action can be rewritten as a Born-Infeld type action and show that the second order expansion of this action is equivalent to New Massive Gravity. We explore solutions to the theory and show that it has a BTZ solution with an effective cosmological constant, a global Lifshitz space-time, regular Lifshitz black holes, as well as asymptotically flat black holes.

Prof. A. Chamorro Seminar Room, Theoretical Physics Seminar Room
Wednesday, October 8th, 2025
Time: 11:40 am