

SHORT TALK

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"Square-Torsion Gravity: a geometric candidate for dark matter"

My current research activity is aimed at exploring the possibility that dark matter be described by spacetime geometry. This is achieved using a special instance of the so called square-torsion theories of gravity. Theories in this class extend the Einstein-Hilbert action with terms quadratic in the torsion tensor. The theory I study seems to have hitherto been neglected due to the fact that the torsion tensor is not totally fixed by the equations of motion. Some torsional degrees of freedom remain to be fixed a priori as though they were external sources. I try to use this analogy with matter and show that it becomes mathematically exact for a spacetime with vanishing spin density. The free degrees of freedom then appear in the Einstein equations as a stress-energy tensor due to torsion. This tensor can take the exact form of dust, which is one of the most successful models for dark matter. During my talk I will present the main ideas underpinning these results and sketch my work in progress.