Contribution ID: **712**   Type: **Talk in the parallel session**

Big-bounce in projectively invariant Nieh-Yan models: Bianchi I cosmology

Friday, 9 July 2021 08:10 (20 minutes)

In this talk I will discuss the possibility to extend the notion of the Nieh-Yan topological invariant to generic metric-affine geometries, where both torsion and nonmetricity are taken into account. Notably, the properties of projective invariance and topologicity can be independently accommodated by a suitable choice of the parameters featuring this new Nieh-Yan term. Considering a special class of modified theories of gravity able to promote the Immirzi parameter to a dynamical scalar field coupled to the Nieh-Yan form, I will discuss in more detail the dynamics of the effective scalar tensor theory stemming from such a revised theoretical framework. I will focus, in particular, on cosmological Bianchi I models and report classical solutions where the initial singularity is safely removed in favor of a big bounce, which is ultimately driven by the nonminimal coupling with the Immirzi field. These solutions are characterized by finite time singularities, but it turns out that such critical points do not spoil the geodesic completeness and wave regularity of these spacetimes.

Primary author: BOUDET, Simon

Presenter: BOUDET, Simon

Session Classification: Extended Theories of Gravity and Quantum Cosmology

Track Classification: Alternative Theories: Extended Theories of Gravity and Quantum Cosmology