Riccardo Moriconi: Chaos Removal in f(R) gravity: the Mixmaster model

Wednesday 28 October 2015 12:00 (30 minutes)

We study the asymptotic dynamics of the Mixmaster Universe, near the cosmological singularity, considering f(R) gravity up to a quadratic corrections in the Ricci scalar R. The analysis is performed in the scalar-tensor framework and adopting Misner-Chitrè-like variables to describe the Mixmaster Universe, whose dynamics resembles asymptotically a billiard-ball in a given domain of the half-Poincarè space. The form of the potential well depends on the spatial curvature of the model and on the particular form of the self-interacting scalar field potential. We demonstrate that the potential walls determine an open domain in the configuration region, allowing the point-Universe to reach the absolute of the considered Lobachevsky space. In other words, we outline the existence of a stable final Kasner regime in the Mixmaster evolution, implying the chaos removal near the cosmological singularity.