

Abstract Submitted
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Kinematical Conformal Cosmology GABRIELE VARIESCHI, Loyola Marymount University — We present an alternative cosmology based on conformal gravity. Unlike past similar attempts our approach is a purely kinematical application of the conformal symmetry to the Universe. As a result of this novel approach we obtain a closed-form expression for the cosmic scale factor $R(t)$ and new fundamental cosmological parameters γ and δ are introduced and evaluated. This emerging new cosmology does not seem to possess any of the controversial features of the current standard model, such as the presence of dark matter, dark energy or of a cosmological constant. Our kinematical conformal cosmology is then able to explain the anomalous acceleration of the Pioneer spacecraft, as due to a local region of gravitational blue-shift. From the reported values of the Pioneer anomaly we also compute the current value of our first fundamental parameter, $\gamma = 1.94 \times 10^{-28} \text{ cm}^{-1}$. Our second fundamental parameter, $\delta = 3.83 \times 10^{-5}$, interpreted as the current value of a cosmological time variable, is derived from a detailed fitting of type Ia Supernovae “gold-silver” data, producing Hubble plots of the same quality of those obtained by standard cosmology, but without requiring any dark matter or dark energy contribution. If further experiments will confirm the presence of an anomalous frequency blue-shift in the outer region of the Solar System, as described by our model, kinematical conformal cosmology might become a viable alternative to standard cosmological theories.

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