

## VII Leopoldo García-Colín Mexican Meeting on Mathematical and Experimental Physics



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### **ROBERTO SUSSMAN: Towards a relativistic covariant interpretation of Milgrom's acceleration**

*Monday, 17 February 2020 17:00 (30 minutes)*

We propose in this letter a relativistic coordinate independent interpretation for Milgrom's acceleration  $a_0 = 1.2 \times 10^{-8} \text{ cm/s}^2$  through a geometric constraint obtained from the product of the Kretschmann invariant scalar times the surface area of 2-spheres defined through suitable characteristic length scales for local and cosmic regimes, described by Schwarzschild and Friedman–Lemaître–Robertson–Walker (FLRW) geometries, respectively. By demanding consistency between these regimes we obtain an appealing expression for the empirical (so far unexplained) relation between the accelerations  $a_0$  and  $cH_0$ . Imposing this covariant geometric criterion upon a FLRW model, yields a dynamical equation for the Hubble scalar whose solution matches, to a very high accuracy, the cosmic expansion rate of the  $\Lambda$ CDM concordance model fit for cosmic times close to the present epoch. While these results are very preliminary and strictly valid only at a toy model level, we believe that they could provide relevant information in the search of alternative gravity theories or even within General Relativity itself.

**Session Classification:** SHORT TALKS

**Track Classification:** SYMPOSIUM ON BLACK HOLES AND GRAVITATIONAL WAVES