

Title

Non-Canonical Volume-Form Formulation of Modified Gravity Theories and Cosmology
and possible correspondence with Causal Fermion Systems

Speaker

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Abstract

A concise description is presented of the basic features of the formalism of non-canonical spacetime volume-forms and its application in modified gravity theories and cosmology. The well known unimodular gravity theory appears as a very special case. Concerning the hot issues facing cosmology now, we specifically briefly outline the construction of: (a) unified description of dark energy and dark matter as manifestations of a single material entity -- a special scalar field "darkon"; (b) quintessential models of universe evolution with a gravity-"inflaton"-assisted dynamical Higgs mechanism -- dynamical suppression/generation of spontaneous electroweak gauge symmetry breaking in the "early"/"late" universe; (c) unification of dark energy and dark matter with diffusive interaction among them; (d) mechanism for suppression of 5-th force without fine-tuning. There also seems to be crucial similarities between these gravity theories with Causal Fermion Systems at the level of their fundamental axioms, so there is a good chance that these gravity theories originate from Causal Fermion Systems.