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Type: Regular Talk (15'+5')

Modified gravity, generalized SU(2) Proca theory, and inflation

Thursday 2 December 2021 09:45 (20 minutes)

This talk will be split into three pieces. In the first part of the talk, I will introduce the common ideas surrounding the modified gravity proposals starting from their main motivation: Einstein gravity, despite all its success on the observational side, is an effective theory. In the second part of the talk, I will present the recent reconstruction of the generalized SU(2) Proca theory (GSU2P for short). As a modified gravity theory that introduces new gravitational degrees of freedom, the GSU2P is the non-Abelian version of the well known generalized Proca theory where the action is invariant under global transformations of the SU(2) group. In the third part of the talk, I will show what the impact of the GSU2P is on the cosmic primordial inflation epoch and what its main challenges are. We study the two-dimensional phase space of the system that results when the cosmic triad configuration is employed in the Friedmann-Lemaitre-Robertson-Walker background and find an attractor curve whose attraction basin both covers almost all the allowed region and does not include a Big-Bang singularity. Such an attractor curve corresponds to a primordial inflationary solution that has the following characteristic properties: 1). it is a de Sitter solution whose Hubble parameter is regulated by a generalized version of the SU(2) group coupling constant, 2). it is constant-roll including, as opposite limiting cases, the slow-roll and ultra slow-roll varieties, 3). a number of e-folds N > 60 is easily reached, 4). it has a graceful exit into a radiation dominated period powered by the canonical kinetic term of the vector field and the Einstein-Hilbert term.

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