

Abstract

Driven by the the fact that a wide family of Ricci-based metric-affine theories of gravity can be reduced to a metric compatible framework, a formal method to map the space of solutions of these generalized gravity theories and the space of solutions of general relativity will be presented. This correspondence will be detailed in the cases where modified gravity is coupled to scalar and U(1)-charged matter. These results allows to use well-established methods and results from General relativity to provide explicit solutions to nonlinear modified gravity theories paving the way to explore new gravitational physics. The presentation will be based on the following publications : [arXiv:1810.04239](#), [arXiv:1807.06385](#), [arXiv:1705.03806](#).