Abstract

I review the missing mass problem in galaxies. I show that possible covariant resolution of this problem leads to $R+f[Riemann^4/(CovariantDerivativeofRiemann)^2]$ gravity provided that non-trivial dynamics of the empty space-time is the source of the problem. The covariant resolution requires defining new physical constants for nature.

In the talk, I also clear some common misunderstanding about f(R) gravity. I show that Phys. Rev. D 74 (2006) 121501 and its conclusion are wrong. I clarify that the Earth-Moon system refutes the covariant resolution suggested by Phys.Rev.D77:104028,2008. I present convincing arguments that no f(R) gravity can account for the missing mass problem.