Dark Energy and Dark Matter as Curvature Effects

Salvatore Capozziello
Dipartimento di Fisica, Università di Napoli "Federico II", Napoli, Italy

Extended Theories of Gravity have recently attracted a lot of interest as alternative candidates to explain the observed cosmic acceleration, the flatness of the rotation curves of spiral galaxies, the gravitational potential of galaxy clusters, and other relevant astrophysical phenomena. Very likely, what we call ``dark matter'' and ``dark energy'' are nothing else but signals of the breakdown of General Relativity at large scales and could be interpreted as a ``curvature effect''. Furthermore, PPN-parameters deduced from Solar System experiments and strong field astrophysical phenomena (black holes, neutron stars, gravitational waves) do not exclude the possibility that such theories could give other observable effects. We review these results giving the basic ingredients of such an approach.