

Dark Energy and Modified Gravity

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Despite more than 10 years of intense experimental and theoretical work, no plausible explanation to the acceleration of the universe is available yet. Dark energy and modified gravity are two likely candidates. I will review their current status and state the problems that they both face. In particular, it turns out that at low energy both approaches reduce to scalar field models essentially. In both cases, the scalar degree of freedom may induce deviations from Newton's law in the solar system and the laboratory, a phenomenon which needs to be screened off. I will present the different screening mechanisms and how the study of large scale structures of the Universe may help to distinguish dark energy/modified gravity models. Eventually I will concentrate on possible laboratory tests of these models and even some consequences for collider physics.

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