Recent results on R^2 and related models of inflation

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The pioneer $R + R^2$ model of inflation (1980) contains only one adjustable parameter taken from observations, has a graceful exit from inflation and a natural mechanism for creation and heating of matter after its end, and produces a very good fit to existing observational data on the power spectrum of primordial scalar (adiabatic density) perturbations. Due to the structure of this model, small quantum-gravitational loop corrections to it from quantum matter fields and gravity itself are important for its dynamics both during and after inflation and can lead to observable effects. Some of these effects are discussed. Recently it was also shown that this model can be included as a particular solution into a weakly non-local UV-complete generalization of quantum gravity which is super-renormalizable or finite and does not contain ghosts.