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Sommario/riassunto	After an extensive introduction to the asymptotic safety approach to quantum gravity, this thesis explains recent key advances reported in four influential papers. Firstly, two exact solutions to the reconstruction problem (how to recover a bare action from the effective average action) are provided. Secondly, the fundamental requirement of background independence in quantum gravity is successfully implemented. Working within the derivative expansion of conformally reduced gravity, the notion of compatibility is developed, uncovering the underlying reasons for background dependence generically forbidding fixed points in such models. Thirdly, in order to understand the true nature of fixed-point solutions, one needs to study their asymptotic behaviour. The author carefully explains how to find the asymptotic form of fixed point solutions within the f(R) approximation. Finally, the key findings are summarised and useful extensions of the work are identified. The thesis finishes by considering the need to

incorporate matter into the formalism in a compatible way and touches upon potential opportunities to test asymptotic safety in the future.