On the higher dimensional Poincaré - Birkhoff theorem for Hamiltonian flows

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In a joint paper with Antonio J. Urena, I have recently obtained some higher dimensional versions of the Poincaré - Birkhoff theorem for Hamiltonian flows. This result has been then further extended in different directions, proving that multiple periodic solutions exist in a variety of situations, including systems with sublinear or superlinear growth, with singular or periodic nonlinearities, and for perturbations of completely integrable systems. Even for some infinite-dimensional Hamiltonian systems, the same theorem together with a limit procedure has been used to prove the existence of periodic solutions. The aim of the talk is to provide an overview on these results with some hints for future developments.

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