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Asymptotically safe gauge-Yukawa theories and functional renormalisation group

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Recently, new four-dimensional (gauge-Yukawa) theories have been discovered which display exact interacting fixed points at highest energies. In a regime where asymptotic freedom is lost, these novel types of theories develop an asymptotically safe UV fixed point, strictly controlled by perturbation theory. In this talk, we extend these studies to include couplings with non-vanishing canonical mass dimension. Using the method of functional renormalisation, we determine the full fixed point potential including higher order invariants of e.g. the scalar and fermionic fields. We also compute the universal scaling exponents and establish consistency of the theory beyond the restriction to classically marginal operators.

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