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Gauge theories with adjoint matter: recent results from the lattice

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In the realm of searches beyond the Standard Model (SM), Yang-Mills theories coupled with adjoint fermions constitute an intriguing possibility. Beyond their relevance in the context of SM extension, studying theories with a different number of dynamical flavors N_f allows access to many distinct physical scenarios, including supersymmetry and conformality. This talk aims to provide a review of (some) recent non-perturbative lattice results for various theories ($N_f = 0, \frac{1}{2}, 1, 2$), exploring their dependence on the number of colors N_c (ranging from 2 to infinity). We will offer an essential overview of commonly used methodologies to address the various computational challenges associated with using adjoint fermions on the lattice, with particular focus on the large-N_c limit. We will then present the main results, highlighting open questions, and suggesting possible directions for future exploration.

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