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The Fate of Chiral gauge theory

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The infrared structure of gauge theories with chiral fermions remains largely unexplored. In this work we investigate the Bars–Yankielowicz class using the functional renormalisation group, building on recent developments in gauge–fermion systems that provide clear criteria for confinement and dynamical symmetry breaking.

We show that two distinct phases arise: one exhibiting both confinement and symmetry breaking at small numbers of colours, and another characterised by confinement without symmetry breaking in the large-colour limit. The latter realises a novel regime, opening the possibility of exotic spectra and phenomena that can now be studied within a systematic framework.

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