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Dynamical origin for the 125 GeV Higgs

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I will describe a hybrid framework for electroweak symmetry breaking (EWSB), in which the Higgs mechanism is combined with a Nambu-Jona-Lasinio mechanism. The model introduces an unconstrained (i.e., acts as “fundamental” but not the SM field) scalar and a strongly coupled doublet of heavy quarks with a mass around 500 GeV, which forms a condensate at a compositeness scale $\Lambda \sim O(1 \text{ TeV})$. This setup is matched at that scale to a tightly constrained hybrid two Higgs doublet model, where both the composite and unconstrained scalars participate in EWSB. This allows us to get a good candidate for the recently observed 125 GeV scalar which has properties very similar to the Standard Model Higgs. The heavier (mostly composite) CP-even scalar has a mass around 500 GeV, while the pseudoscalar and the charged Higgs particles have masses in the range 200 -300 GeV.

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