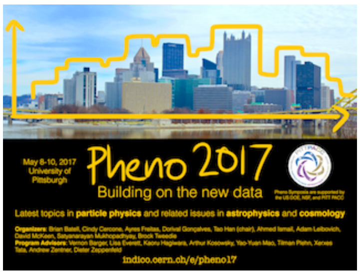

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Split branes and Flavor Universal Resonances

Tuesday, May 9, 2017 3:00 PM (15 minutes)

Warped higher-dimensional compactifications with "bulk" standard model, or their AdS/CFT dual as the purely 4D scenario of Higgs compositeness and partial compositeness, offer an elegant approach to resolving the electroweak hierarchy problem as well as the origins of flavor structure. However, low-energy electroweak/flavor/CP constraints and the absence of non-standard physics at LHC suggest that a "little hierarchy problem" remains, and that the new physics underlying naturalness may lie out of LHC reach. In this talk, assuming this to be the case, I will show that there is a simple and natural extension of the minimal warped model in the Randall-Sundrum framework, in which matter, gauge and gravitational fields propagate modestly different degrees into the IR of the warped dimension, resulting in rich and striking consequences for the LHC (and beyond). The LHC-accessible part of the new physics is AdS/CFT dual to the mechanism of "vectorlike confinement", with TeV-scale Kaluza-Klein excitations of the gauge and gravitational fields dual to spin-0,1,2 composites. Unlike the minimal warped model, these low-lying excitations have predominantly flavor-blind and flavor/CP-safe interactions with the standard model. Remarkably, this scenario also predicts small deviations from flavor-blindness originating from virtual effects of Higgs/top compositeness at O(10)TeV, with subdominant resonance decays into Higgs/top-rich final states, giving the LHC an early "preview" of the nature of the resolution of the hierarchy problem. Discoveries of this type at LHC Run 2 would thereby anticipate (and set a target for) even more explicit explorations of Higgs compositeness at a 100 TeV collider, or for next-generation flavor tests.

Summary

Extension of minimal RS framework and new physics via holographic vector-like confinement.

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