Contribution ID: **1252** Type: **Parallel session talk**

Trinification from a complete E_6 GUT model

Friday 19 July 2024 12:10 (17 minutes)

E_6 Grand Unified Theories introduce novel symmetry-breaking patterns compared to the more common $SU(5)$ and $SO(10)$ GUT. We explore in this talk how $SU(3)^3$ (trinification), $SU(6) \times SU(2)$ and $SO(10) \times U(1)$ symmetries can explicitly arise from E_6 at an intermediate breaking stage.

Due to perturbative limitations associated with very large E_6 representations, the 650 emerges as the unique candidate for breaking into one of the novel symmetries. We find suitable minima of its scalar potential and subsequently construct a complete model with the scalar sector $27 + 351' + 650$.

The model facilitates a two-stage breaking to the Standard Model alongside a realistic Yukawa sector. We determine for each novel breaking pattern the intermediate effective theory consistent with the extended survival hypothesis (and a $\mathbb{Z}_2$ parity that gives a dark matter candidate), and analyze unification constraints and proton decay lifetime for these minimal scenarios.

Alternate track

1. Formal Theory

I read the instructions above

Yes

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