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Explaining the SM flavor structure with grand unified theories

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We do not know why there are three fermion families in the Standard Model (SM), nor can we explain the observed pattern of fermion masses and mixing angles. Standard grand unified theories based on the SU(5) and SO(10) groups fail to shed light on this issue, since they also contain three copies of fermion representations of an enlarged gauge group.

However, it does not need to be so. In this talk, I will discuss the possibility that the Standard Model families are distributed over distinct representations of a grand unified model, in which case the gauge symmetry itself might discriminate the various families and explain (at least partially) the flavor puzzle.

Secondary track (number)

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