## New Physics Directions in the LHC era and beyond



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## Tri-unification: a separate SU(5) for each fermion family

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I discuss a grand unified theory that assigns a separate SU(5) gauge group to each fermion family. The equality of the gauge couplings at the unification scale is enforced by means of a cyclic  $\mathbb{Z}_3$  symmetry. Such *tri-unification* reconciles the idea of gauge non-universality with gauge coupling unification, opening the possibility to build consistent non-universal descriptions of Nature that are valid all the way up to the scale of grand unification. A minimal example which can account for all the quark and lepton masses and mixings will be presented, showing that it is possible to unify the gauge couplings into a single value associated with the cyclic  $SU(5)^3$  gauge group while being consistent with the existing proton decay searches, in particular in the dominant  $e^+\pi^0$  channel.

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