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Title:	New minimal SO(10) GUT: A theory for all epochs
Authors:	Aulakh, C.S. (/jspui/browse?type=author&value=Aulakh%2C+C.S.)
Keywords:	Supersymmetry Grand unification SO(10) Flavour unification
Issue Date:	2016
Publisher:	Springer Link
Citation:	Pramana - Journal of Physics, 86(2), pp. 207-221
Abstract:	The supersymmetric SO(10) theory (NMSO(10)GUT) based on the $210+126+126$ Higgs system proposed in 1982 has evolved into a realistic theory capable of fitting the known low energy particle physics data besides providing a dark matter candidate and embedding inflationary cosmology. It dynamically resolves longstanding issues such as fast dimension five-operator mediated proton decay in SUSY GUTs by allowing explicit and complete calculation of crucial threshold effects at M SUSY and M GUT in terms of fundamental parameters. This shows that SO(10) Yukawas responsible for observed fermion masses as well as operator dimension-five-mediated proton decay can be highly suppressed on a 'Higgs dissolution edge' in the parameter space of GUTs with rich superheavy spectra. This novel and generically relevant result highlights the need for every realistic UV completion model with a large /infinite number of heavy fields coupled to the light Higgs doublets to explicitly account for the large wave function renormalization effects on emergent light Higgs fields. The NMSGUT predicts large-soft SUSY breaking trilinear couplings and distinctive sparticle spectra. Measurable or near measurable level of tensor perturbations – and thus large inflaton mass scale – may be accommodated within the NMSGUT by supersymmetric see-saw inflation based on an LHN flat direction inflaton if the Higgs component contains contributions from heavy Higgs components. Successful NMSGUT fits suggest a renormalizable Yukawon ultraminimal gauged theory of flavour based upon the NMSGUT Higgs structure.
URI:	<a href="https://link.springer.com/article/10.1007%2Fs12043-015-1141-2">https://link.springer.com/article/10.1007%2Fs12043-015-1141-2</a> ( <a href="https://link.springer.com/article/10.1007%2Fs12043-015-1141-2">https://link.springer.com/article/10.1007%2Fs12043-015-1141-2</a> ) <a href="http://hdl.handle.net/123456789/2479">http://hdl.handle.net/123456789/2479</a> ( <a href="http://hdl.handle.net/123456789/2479">http://hdl.handle.net/123456789/2479</a> )
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