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Interesting Models unifying Neutrino Mass, Dark Matter, Origin of PMNS and CKM, and GUT

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The Standard Model of particle physics have been extremely successful so far, but there are still many unanswered questions like the origin of neutrino mass, nature of dark matter, the source of quark and lepton flavor mixing and their possible correlation, the theory of grand unification of all SM interactions. In this talk I will focus on some interesting models that attempt to answer these questions and possible correlation between them. Embedding a Pati-Salam quark-lepton unification symmetry, $SU(4)_c \otimes SU(2)_L \otimes U(1)_R$, into SU(7) GUT with a Scotogenic radiate neutrino mass and LHC phenomenology will be discussed. I will also touch on $G_{SM} \otimes U(1)_{B-L}$ with residual Z_4 symmetry leading to Scotogenic radiative Dirac neutrino masses with dark matter, $0\nu 4\beta$ and absence of $0\nu 2\beta$ signal and phenomenology of related rare processes. Possible common origin of CKM and PMNS mixings in a complete model. Other possible topics will include chiral dark sector with composite dark matter leading to Scotogenic two loop neutrino mass and neutrino portal to SM.

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