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A common framework for fermion mass hierarchy, leptogenesis and dark matter

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In this talk I will describe an extension of the Standard Model designed to elucidate the fermion mass hierarchy, account for the dark matter relic abundance, and explain the observed matter-antimatter asymmetry in the universe. Beyond the Standard Model particle content, the model introduces additional scalars and fermions. Notably, the light active neutrinos and the first two generations of charged fermions acquire masses at the one-loop level. The model accommodates successful low-scale leptogenesis, permitting the mass of the decaying heavy right-handed neutrino to be as low as 10 TeV. I will also discuss its phenomenological consequences in dark matter, charged lepton flavor violation, as well as the constraints arising from electroweak precision observables, and implications for collider experiments.

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