Abstract

Despite being very successful in explaining the wide range of precision experimental results obtained so far, the Standard Model (SM) of elementary particles fails to address the two greatest discoveries of the recent decades: dark matter (DM) and tiny but nonzero neutrino masses. Typically the new models beyond the SM explain only one of these observations. Instead, in the present article, we take the view that they both point towards the same new extension of the Standard Model. The new particles introduced are responsible simultaneously for neutrino masses and for the dark matter of the Universe. The stability of dark matter and the smallness of neutrino masses are guaranteed by a U(1) global symmetry, broken to a remnant $_2$. The canonical seesaw mechanism is forbidden and neutrino masses emerge at the loop level being further suppressed by the small explicit breaking of the U(1) symmetry. The new particles and interactions are invoked at the electroweak scale and lead to a rich phenomenology in colliders, in lepton flavour violating rare decays and in direct and indirect dark matter searches, making the model testable in the coming future.