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# Neutrinos and Abelian Gauge Symmetries

We present the intimate connection between neutrinos and abelian gauge symmetries U(1)', starting from the observation that the full global symmetry group of the Standard Model G = U(1){B-L} x U(1){L_e - L_mu} x U(1){L_mu - L_tau} *can be promoted to a local symmetry group by introducing three right-handed neutrinos— automatically making neutrinos massive and thereby alleviating one of the major shortcomings of the Standard Model. The unflavored part U(1)*{B-L} is linked to the Dirac vs. Majorana nature of neutrinos, and can give rise to the novel framework of lepton-number-violating Dirac neutrinos. Flavored U(1)' ⊂ G can shed light on the mass ordering and peculiar mixing pattern displayed by neutrinos, in an economic and testable manner. Beyond G, even abelian symmetries in an additional dark matter sector can influence neutrino physics, for example by providing a naturally light sterile neutrino, which mixes with the active neutrinos and can resolve some long-standing experimental anomalies.

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