Abstract of Talk

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Title: Nonabelian Dark Matter with Resonant Annihilation

We construct a model based on an extra gauge symmetry, $SU(2)_X \times U(1)_{B-L}$, which can provide gauge bosons to serve as weakly-interacting massive particle dark matter. The stability of the dark matter is naturally guaranteed by a discrete $Z_2$ symmetry that is a subgroup of $SU(2)_X$. The dark matter interacts with standard model fermions by exchanging gauge bosons which are linear combinations of $SU(2)_X \times U(1)_{B-L}$ gauge bosons. With the appropriate choice of representation for the new scalar multiplet whose vacuum expectation value spontaneously breaks the $SU(2)_X$ symmetry, the relation between the new gauge boson masses can naturally lead to resonant pair annihilation of the dark matter. After exploring the parameter space of the new gauge couplings subject to constraints from collider data and the observed relic density, we use the results to evaluate the cross section of the dark matter scattering off nucleons and compare it with data from the latest direct detection experiments.