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## Halo-independent bounds on the non-relativistic effective theory of WIMP-nucleon scattering from direct detection and neutrino observations

*Friday 24 February 2023 11:40 (20 minutes)*

In my presentation I will talk about the halo-independent bounds on the WIMP-nucleon couplings of the non-relativistic effective Hamiltonian that drives the scattering process off nuclei of a WIMP of spin  $1/2$ . We will see that for most of the couplings the degree of relaxation of the halo-independent bounds compared to those obtained by assuming the Standard Halo Model is with few exceptions relatively moderate in the low and high WIMP mass regimes, where it can be as small as a factor of 2, while in the intermediate mass range (10 – 200 GeV) it can be as large as 1000. An exception to this general pattern, with more moderate values of the bound relaxation, is observed in the case of the spin-dependent type WIMP-proton couplings with no or a comparatively small momentum suppression, for which WIMP capture in the Sun is strongly enhanced because it is driven by scattering events off Hydrogen, the most abundant target in the Sun. Within this class of operators the relaxation is particularly small for interactions that are driven by only the velocity-dependent term, for which the solar capture signal is enhanced because of the high speed of scattering WIMPs inside the strong gravitational field of the Sun.

**Presenter:** Dr KAR, Arpan (Sogang University)

**Session Classification:** Dark Matter