

The Migdal effect and bremsstrahlung in effective field theories of dark matter scattering

Thursday 5 December 2019 15:50 (20 minutes)

Creative ideas for extending the reach of large scale dark matter direct detection experiments to low mass WIMPs include exploiting inelastic detection channels. Two examples are the Migdal effect (atomic ionization) and photon bremsstrahlung from the recoiling nucleus. We calculated these effects for a variety of momentum- and spin-dependent dark matter interactions described by non-relativistic effective field theories. In addition we have calculated these effects for coherent neutrino-nucleus scattering, we compare these rates with the elastic nuclear and electronic scattering rates. Lastly, I will show detailed detector simulations of the Migdal effect that will be used to faithfully evaluate the effects impact on future experiments.

Authors: Dr NEWSTEAD, Jayden (Purdue University); BELL, Nicole (University of Melbourne); DENT, James (Sam Houston State University); WEILER, Thomas (Vanderbilt University); Dr SABHARWAL, Subir

Presenter: Dr NEWSTEAD, Jayden (Purdue University)

Session Classification: Parallel

Track Classification: Dark matter