Contribution ID: **46** Type: **not specified**

Large radiative effects on dark matter annihilation resummed

Wednesday 25 September 2019 16:45 (20 minutes)

A particularly promising prediction of several wimp DM models is the quasi-monochromatic emission of gamma rays due to their pair-annihilation in e.g. the innermost part of the Milky Way. High energy gamma-ray fluxes due to such annihilation processes are naively suppressed by the inverse-squared dependence on the heavy DM mass and by the fact that the cross section is loop-suppressed. However, non-perturbative effects (Sommerfeld) can play the opposite role of enhancing the signal by several orders of magnitude.

Relatedly, the different scale hierarchies present in the problem pose an additional technical difficulty. Namely, the appearance of large (Sudakov) logarithms that -on top of the Sommerfeld effect- break the validity of the perturbative expansion. In order to resum these, we employ soft-collinear effective-field-theory (SCET) methods.

By means of process-specific factorization theorems, we are able to make very precise (Next-to-Leading Log prime) predictions for the relevant annihilation cross sections. Focusing, for concreteness, on the pure-wino model I will give in this talk a short overview of these methods and their application to indirect DM detection with gamma-ray telescopes.

Primary author: Dr VOLLMANN, Martin (TUM)

Presenter: Dr VOLLMANN, Martin (TUM)

Session Classification: Parallel Session: Cosmology & Astroparticle Physics

Track Classification: Cosmology & Astroparticle Physics