



Contribution ID: 316

Type: not specified

Probing Theories of Dark Matter with Direct Detection

Wednesday, August 5, 2015 4:18 PM (18 minutes)

In the event of dark matter direct detection, learning in a data-driven way about the interactions between dark matter and the Standard Model will be of utmost importance. In new work, coworkers and myself have demonstrated the possibilities for Bayesian model selection of a wide class of theories in a potential future situation where direct detection is confirmed by a variety of different targets. We find that multiple detector elements are needed to confidently extract the details of the dark matter - Standard Model interaction. After properly accounting for the UV particle physics and the low-energy nuclear physics, we also find that currently proposed detectors (crucially including a target with iodine or fluorine) are capable of breaking degeneracies between a very large range of interesting models.

Oral or Poster Presentation

Oral

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Session Classification: AstroParticle, Cosmology, Dark Matter Searches, and CMB

Track Classification: Cosmology and Dark Matter Experiment