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(Runaway) Gravitational Production of Dark Photons

Tuesday, May 14, 2024 3:00 PM (1 hour)

Gravitational particle production is the process by which particles are created due to the expansion of space-time during inflation. In this talk we will discuss aspects of gravitational particle production of dark photons, a popular dark matter candidate, with a particular focus on dark photons with nonminimal couplings to gravity. I will first show that the inclusion of nonminimal couplings can lead to instabilities in the theory, namely ghosts and “runaway” production, and that the parameter space for the couplings is limited in order to avoid such instabilities. Lastly, within the allowable non-ghost and non-runaway region of parameter space, I will show that dark photons can be produced in the correct abundance to account for all of the dark matter today.

Presenter: JENKS, Leah (KICP, University of Chicago)