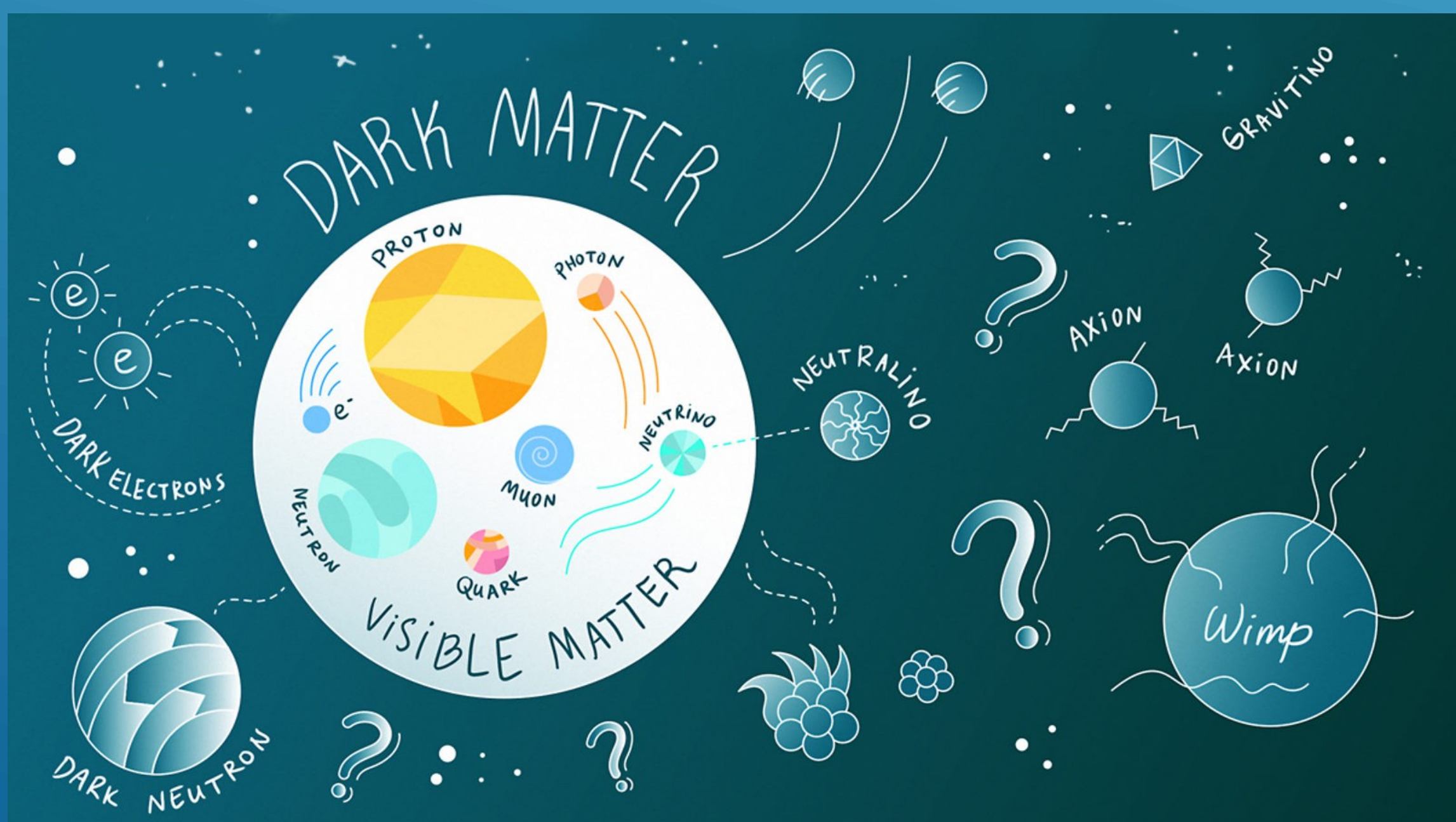


Particle Phenomenology

« Dark Matter Genesis in the Reheating Era »

Kuldeep Deka - New York University Abu Dhabi, United Arab Emirates

The post-inflationary reheating era plays a pivotal role in shaping the thermal history of the Universe, yet its dynamics remain poorly understood. In this talk, I will examine how various reheating scenarios impact dark matter (DM) production, encompassing both thermal and nonthermal origins. Using general parametrizations for the Hubble expansion rate and the evolution of the Standard Model temperature, I will present a unified framework to study DM genesis—including freeze-out mechanisms (WIMPs, SIMPs, ELDERS, Cannibals) and freeze-in processes (both infrared and ultraviolet regimes). These dynamics can significantly alter the viable DM parameter space, enabling much heavier thermal DM candidates and extending the reach for light feebly interacting particles. I will highlight the interplay between theoretical predictions and experimental constraints, emphasizing how future searches could uncover distinctive imprints of DM production during reheating.



July 9, 2025
Amphi Dirac, 11 am