

Astrophysical probes and rare-event limits on dark photons

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More often than not, astrophysical probes are superior to direct laboratory tests when considering light, very weakly interacting particles and it takes clever strategies and/or ultra-pure experimental setups for direct tests to be competitive. In this talk, I will review the astrophysical side of the story with a particular focus on dark photons and axion-like particles. I will present results on the emission process of dark photons with mass below 10 keV from the interior of stars and ensuing constraints on the atomic ionization rate from a solar flux imposed by Dark Matter experiments. Conversely, dark photons with mass above 1 MeV may inject visible energy into the early Universe, leading e.g. to departures from standard primordial nucleosynthesis predictions of light elements. In this case I will show how cosmology offers unique sensitivity when laboratory probes are out of reach.