WISP Cosmology Woking Group meeting of the COST Action Cosmic WISPers

Report of Contributions

https://indico.desy.de/e/48394

Contribution ID: **1** Type: **not specified**

New avenues to probe Fuzzy Dark Matter

Based on two different effects that FDM produces on DM halos, making a core at the center and preventing the formation of very light ones. I will show constraints and propose new avenues based on new observations and techniques to probe the ultralight end of the DM mass

Presenter: URRUTIA, Juan (Tallinn)

Contribution ID: **2** Type: **not specified**

Gravitational wave signatures of dark matter around binary black holes

Some of the most well-motivated extensions of the Standard Model of particle physics introduce light scalar fields to explain the origin of dark matter. These fields interact with black holes and can alter the gravitational waveforms produced by binary merger events. In this talk, I will discuss the use of numerical relativity simulations to study these signatures.

[Based on https://arxiv.org/abs/2210.09254, https://arxiv.org/abs/2311.18156, https://arxiv.org/abs/2409.01937]

Presenter: Dr AURREKOETXEA, Josu (MIT)

Contribution ID: **3** Type: **not specified**

Experimental targets for dark photon dark matter

Ultralight dark photon dark matter features distinctive cosmological and astrophysical signatures and is also supported by a burgeoning direct-detection program searching for its kinetic mixing with the ordinary photon over a wide mass range. However, dark photons cannot necessarily constitute dark matter across all of this parameter space. In this talk, I will show that in minimal models where the dark photon mass originates from a dark Higgs mechanism, early Universe dynamics can often breach the regime of validity of the Proca effective action. In the process, the dark sector can collapse into a cosmic string network, precluding dark photons as viable dark matter, and motivating certain regions of mass-coupling parameter space over others. I will then turn the argument on its head and address to what extent a discovery of a dark photon by any proposed haloscope would imply a more complex dark sector.

Presenter: Dr CYNCYNATES, David (U. Washington, Seattle)